

ARCHIVES OF OTOLOGY.

THE HEARING POWER IN CASES OF BILATERAL CONGENITAL ATRESIA OF THE AUDITORY CANAL WITH RUDIMENTARY AURICLE.

BY PROF. F. BEZOLD, MUNICH.

Translated by Dr. WARD A. HOLDEN.

IN the course of years I have twice had the opportunity of observing cases of bilateral congenital atresia of the canal with rudimentary auricle, and in both I was able to make careful tests of the hearing.

Since the deformity affects the hearing so much that a whisper cannot be heard and conversational tones must be used in testing, it is clear that reliable results can be obtained only when the deformity is bilateral.

CASE I (seen in 1891).—M. D., a boy of twelve, is of healthy parentage, nor is there consanguinity, and the two other children of the family are healthy. In place of the auricle is a longitudinal fold 46 *mm* long on the right side and 43 on the left. No trace of canal. Mastoid process well developed and the articular process of the lower jaw rests directly on the mastoid. The child began to speak at the age of eighteen months, but only learned to speak well at the age of four years.

For the whispering voice all numbers, excepting 5 and 9, which are not understood, are heard directly before the ear; for the conversational voice the hearing distance is 12 *cm* on each side; 4 and 3 are recognized with the greatest difficulty; the other numbers are understood in part at 20 *cm*.

Tested with the continuous series of tones

the lower tone limit for air conduction on each side is d^1

upper tone limit Galton's whistle $\left\{ \begin{array}{l} \text{right } 4.0 \\ \text{left } 4.1 \end{array} \right.$

No defects either for forks or for whistle. The duration of perception for Lucae's forks c^4 and $f^{\#4}$ by air conduction was 0.4 of the normal.

The fork A on the vertex is heard 8 sec. and the fork a^1 6 seconds prolonged.

Rinné with a^1 $\left\{ \begin{array}{l} \text{right} - 15 \text{ sec.} \\ \text{left} - 20 \text{ sec.} \end{array} \right.$

The boy was mentally well developed and the results obtained are reliable.

As this was not the case in the next patient, the duration of perception on the vertex is not set down. Having no continuous series at that time excepting the Galton whistle, the lower tone limit could only be determined approximately.

CASE 2 (seen in 1889).—S. H., a girl of seven years, of healthy family, had in place of the right auricle only a vertical fold of integument containing a cartilaginous mass. On the left side the rudimentary auricle had a helix, an antihelix, and a fairly developed lobule. A cartilaginous tragus and antitragus near each other could be felt under the skin, and between the two a small funnel-shaped depression indicated the location of the cartilaginous canal. The rudimentary auricle seemed to rest directly on the articular process of the lower jaw on each side. The child speaks familiar words readily, but repeats new words with difficulty.

The whispered voice is heard imperfectly directly before the ear.

Conversational voice $\left\{ \begin{array}{l} \text{right } 30 \text{ cm} \\ \text{left } 18 \text{ cm} \end{array} \right.$

for the numbers 5 and 9, while the other numbers are recognized at a greater distance.

A watch usually heard at 1 m distance is heard on each side when pressed on the ear. The forks $f^{\#4}$, f^3 and a^2 were all heard by air conduction and when placed on the vertex or on the ear. Below a^1 no forks were heard by air conduction, but a^1 , a , A , F^{-1} and C^{-1} were all heard by bone conduction. All organ-pipe tones down to f^2 , the lowest, were heard on each side. The upper tone limit with Galton's whistle was 4.5 on each side.

This case is of particular interest since Dr. Rotter undertook to find the canal on each side by operative measures. After detaching the skin and cartilage the articular process was exposed, but no trace of canal was found. The wounds were closed with sutures and healed by first intention.

The results of the tests of hearing with allowances for the youth of the patient and the means that were then at my command, were altogether similar to those obtained in the other case; and a similar result was obtained by Schwendt.¹

To determine the morphological peculiarities which underlie the form of auditory disturbance found in these cases, an abstract of the literature of autopsies in cases of atresia (13 cases) was made by my pupil, Joël ("On Atresia Auris Congenita," these ARCHIVES, xviii., p. 317). Three later cases have been reported by Ranke. These are as follows:

Author and Journal.	Age.	Tympanum.	Ossicles.	Windows.	Labyrinth.	Hearing.
H. v. Ranke, <i>Report of Society of Morph.</i> , Munich, 1885, 2d part, p. 130.	1½ years.	Wanting.	Wanting.	Wanting.	Normal.	—
Bezold, cf. Joël, <i>Zeitschr. f. Ohrenh.</i> , xviii., p. 278.	8 mos.	Small.	Stapes lost in maceration, malleus and incus wanting.	Oval window reduced ½; round window normal.	Normal.	—
H. v. Ranke, <i>Munch. med. Wochenschr.</i> , 1893, No. 37.	5½ mos.	Cleft.	Malleus and incus a single bone.	Windows not exposed.	Normal, but smaller than the other.	—

Thus the disturbance seems to be limited to the outer and middle ear, and affects particularly the annulus tympanicus which has mostly been wanting, then the malleus and incus which are absent or rudimentary, and as a rule also the stapes. In ten of the sixteen cases the labyrinth was entirely normal, corresponding to the auditory results we have obtained. In both of my cases the lower end of the scale was wanting for air conduction, but by bone conduction the entire scale from C^{-1} to the highest pitch of Galton's whistle was perceived. No breaks were found that would indicate labyrinthine involvement.

The hearing power in these cases may be considered that of an intact labyrinth shut off from the action of aerial waves of sound (except in so far as these may be carried to

¹ "On Congenital Deformities of the Auditory Organ in Connection with Branchiogenic Cysts and Fistulæ."—*Arch. f. Ohrenh.*, xxxii., p. 37.

the stapes through the Eustachian tube), and with disturbances in the conducting chain.

If the labyrinth is normal we must suppose the auditory disturbances to be due not only to the shutting off of the labyrinth from external communication, but also and in equal measure to the anomalies in the conducting apparatus, for simple closure of the bony canal, as for example by a plug of cerumen when the middle ear is normal, does not reduce the hearing to the degree that we find it reduced in these cases of atresia. The abnormalities in the conducting apparatus in cases of congenital atresia are so manifold that in considering their influence on the function of the ear, it is impossible to bring them into a single category.

Leaving out of consideration the reported cases in which labyrinthine anomalies have been found, it must remain an open question whether there can be any hearing when the tympanum is entirely absent.

It must also remain doubtful whether there can be any hearing when one or both labyrinth windows are congenitally absent.

Apart from the two cases reported of total absence of the tympanic cavity, an absence of both windows has been noted only once (in a deaf patient of Lucae's). In two other cases the oval window was found to be diminished in size. The round window was found to be small in two cases, normal in two, and no statement in regard to its size is mentioned in the others.

As respects the conducting chain, a regular drum membrane with a malleus was not found in any case. The ossicles were mostly absent, and when present were rudimentary, the stapes only being in a few cases but slightly abnormal.

It should also be noted that in four cases it was stated that there was fixation of the foot plate, three times from bony anchylosis, although in only a few cases the condition of the stapes was mentioned.

In grouping together the results of auditory tests in these cases we find (1) a lengthening of the normal time for bone conduction, (2) a marked negative Rinné, and (3) a defect

for low tones by air conduction. Thus we have the same symptom complex in cases of congenital atresia of the canal that we find in acquired disturbances in the conducting apparatus, and particularly in fixation of the stapes. From this we may draw the conclusion that in the cases of deformity the cause of the disturbance of hearing also has its location, not in the inner, but in the middle and outer ear.

A CONTRIBUTION TO THE DIAGNOSIS AND
TREATMENT OF CHOLESTEATOMA IN OTI-
TIS MEDIA PURULENTA CHRONICA.

By A. SCHEIBE, OF MUNICH.

Translated by Dr. A. B. KIBBE, Seattle, Washington.

AS is well known, pathologists and aurists generally differ in their views as to the place in pathology to be assigned to cholesteatoma of the middle ear. The former, as a rule, agree with Virchow, that it is a primary tumor-formation, while aurists, arguing from both pathology and clinical experience, are, at least, unanimous in the opinion that in the vast majority of the cases it is not a primary tumor-formation, but rather that its pathology consists in the replacement of the epithelium of the mucosa by an epidermic covering, the superficial layers of which are cast off and collected in the form of tumor-like masses. It is to be expressly emphasized (see Steinbrügge, *Pathological Anatomy*) that not the dead and exfoliated cells are to be considered as the pathological foundation of cholesteatoma, but rather the matrix, the rete of the epidermis itself. From this it is evident that the diagnosis of cholesteatoma of the middle ear can only be made with certainty if by inspection an epidermic transformation of at least a part of its mucous membrane can be demonstrated. Likewise the presence of cast-off scaly epidermis masses in the middle ear are to be looked upon as favoring the diagnosis. Bezold has called attention to a further and important diagnostic aid in the position and character of the perforation in the drumhead: "As soon as the sharp boundary between the cutis and mu-

cosa disappears at any point by a destruction of the surface, we observe the cutis (or epidermis) spreading out and gradually replacing the mucosa. So long as the perforation in the drumhead is central, even though extensive in area, the mucosa shows no epidermic coating,"—the remains of the drumhead at the periphery acting as a protective wall against the encroachment of the epidermis. In many cases the epidermic transformation is not visible by direct inspection, and is demonstrated only when repeated syringing with the tympanic tube has brought away cholesteatomatous masses.

In order to test the truth of Bezold's statements in detail, I have used material from my private practice as well as results of autopsies collected by Prof. Bezold and kindly placed at my disposal.

Two questions are to be answered :

1. In what percentage of cases of middle-ear suppuration, on the one hand with peripheral perforations, and on the other with central, but with adhesion of the edges of the perforation to the inner wall of the tympanum, may epidermoidal change or collections of epithelial masses be demonstrated ?

2. Does cholesteatoma occur also in chronic suppuration of the middle ear with central perforation and completely free edges of the same ?

Cases under 1 may be divided into two groups :

a. All cases of central perforation with adhesions of the edges, and those peripheral perforations which border on the walls of the tympanum.

b. Cases of peripheral defects which border on the wall of the aditus—that is, perforations in the superior and superoposterior border. Perforations through Shrapnell's membrane also belong to this class.

In group *a* the diagnosis of the epidermoidal transformation can be made by examination with the mirror. In certain cases active inflammation or granulations may render the diagnosis at first impossible, but treatment of these conditions will finally render it certain.

The diagnosis in class *b* is essentially difficult. Otoscopic examination alone is not sufficient. Operative opening of

the diseased spaces is, in many cases of narrowing of the meatus, the only method of rendering it certain, but is not justifiable for such purpose alone. The use of the tympanic tube is not only indicated but is indispensable, but in its employment certain precautions are necessary. The meatus must first be thoroughly cleansed in order to make certain that the collections of epidermis come from the middle ear. In many cases these masses are not seen at the first syringing but only after several trials.

By aid of this method I was able to demonstrate in 48 cases in part epidermoidal change in the mucosa of the aditus, in large defects of the meatus, sometimes up to the antrum; in others I could demonstrate the presence of cast-off layers of epidermis in the upper middle-ear spaces. In each of these 48 cases a perforation existed such as is described in group *b*. Pure cases of perforations of Shrapnell's membrane were rarely seen. Not uncommonly the defect extended to the adjacent upper or posterior wall of the meatus. Combinations of both these forms were often observed. In many instances, in addition to those of group *b*, some belonging to group *a* were met with, particularly adhesions of the anterior edge of the perforation to the inner wall, also central perforations with completely free borders. In addition, the findings in 14 autopsies of cholesteatoma of the upper spaces of the middle ear were placed at my disposal as further material to assist in answering the first of the above questions. In 12, ear disease was the cause of death, in others its discovery was accidental. Of the 12 cases 6 were seen during life, all with more or less strongly pronounced pyæmic or cerebral symptoms. In 5, operative interference was undertaken in spite of the apparently hopeless conditions. In 1 the thrombosed lateral sinus was opened. The otoscopic findings were as follows: In the 2 cases not resulting in death, perforation of Shrapnell's membrane once, exposure of the posterior upper portion of the margo tympanicus once. In the 12 ending fatally, defect of Shrapnell's membrane and in part of the adjacent tissue 6 times, defect of the drumhead up to the posterior upper rim of the margo also 6 times. In 4 of the

latter the adjacent posterior upper wall of the meatus was wanting, though not having been removed by operation. In 4 cases the findings show adhesion of the isolated manubrium twice, and adhesion of the edge of the perforation in the drumhead to the inner wall of the tympanum twice.

Cannot the deduction therefore be made as a general rule *that where a peripheral perforation exists or there is a central one, but the edge of the latter is adherent to the inner wall of the tympanum, cholesteatoma must always be present?*

To decide this question, it is necessary to ascertain how cholesteatoma originates, and of what secondary pathological changes the cholesteatoma matrix is formed.

With reference to its origin, the Bezold-Haberman theory, that the epidermoidal transformation of the mucosa of the middle ear arises from the direct inward growth of the epidermis of the drumhead or of the meatus upon the mucous membrane deprived of its epithelium, that what is termed cholesteatoma is nothing more than a process tending toward a cure, is continually gaining more adherents.

The most certain substantiation of this theory is obtained by autopsies. In those above mentioned, where attention was paid to this point, direct connection with the epidermis of the meatus was never missed.

Relative to the second of the two questions, "Does cholesteatoma occur in chronic suppuration of the middle ear with central perforation and completely free edges?" I have never been able to demonstrate it in any case observed clinically, nor among those autopsies coming under my observation.

As a criterion of the various means of diagnosis I have tabulated the results in my 48 cases of cholesteatoma of the upper middle-ear spaces with the following results: Opening the antrum always rendered the diagnosis certain if resection of the posterior wall of the meatus was combined with it (5 times). Schwartze's operation, on the contrary, failed twice in 4 cases. Otoscopic examination resulted in direct demonstration in 75 per cent. of the cases. By aid of the tympanic syringe cholesteatomatous masses were discovered in 91 per cent.

The difficulties in diagnosis, like the difficulty in treatment, vary according to the locality of the epidermisation. If this be confined to the tympanic portion of the middle ear, treatment is simple. These cases are quite as amenable to boracic acid treatment as are uncomplicated cases of middle-ear suppuration.

The same process which in the tympanic cavity is to be looked upon as a healing one, may lead to the severest consequences as soon as it extends to the aditus and antrum. From the drum cavity, the masses of cast-off epidermis may be eliminated without hindrance; from the upper spaces, however, a complete elimination is almost impossible, owing to the narrow passage. As long as these masses remain, they act as foreign bodies which increase suppuration, and produce further keratosis of the epidermic covering.

Few cases are cured by antiseptic treatment restricted to the tympanic portion of the middle ear, and then only when the perforation is wide, and gives free egress to the epidermic masses.

In my practice 48 cases of cholesteatoma were met with in 145 cases of middle-ear suppuration. Of this number 3 were well when they came under observation.

Of the remaining 45, 38 were treated by direct injection and insufflation. Of these there were cured 18, or 47 per cent. Still under treatment 11, or 29 per cent. Disappeared, 8, or 21 per cent. Of the latter, 1 is reported to have died later from cerebral abscess. Cured by chiseling, 1, or 3 per cent. The average number of treatments in each case was 13—least number, 1; greatest, 103.

Only two reports on the results of direct injection and insufflation are at hand. Gomperz¹ reports the history of 49 cases, in part with cuts, of the drumhead; 36 were cured, 3 uncured, and 10 abandoned the treatment,—certainly a good result. Siebenmann² reports only the cases in which the cure persisted for a number of years. They composed about one fifth of the number. A further method is the removal of the ossicles through the intact meatus (Kessel, Schwartze),

¹ *Mouatschr. f. Ohrenhkl.*, 1892, No. 12.

² *Berlin. klin. Woch.*, No. 33, 1893.

or after drawing out the cutaneous meatus and chiselling away the outer wall of the aditus (Stacke). This is often practised in cholesteatoma of the upper middle-ear spaces.

Schmiegelow¹ has lately reported unusually good results with Stacke's operation. Of 40 patients with cholesteatoma 9 were treated by chiselling open the aditus. Of these 8 were cured, though 2 suffered from recurrence later.

In such cases chiselling away the external wall of the aditus without extraction of the ossicles may suffice for a cure. What has been often through careless observation called caries of the ossicles, is simply the healing stage of this disease and of rarefying otitis or pressure erosion. In my practice and in the clinic I know of no case of cholesteatoma in which a diseased ossicle has prevented a cure, provided the opening into the cavity was sufficiently large. When one or several of the small bones were removed this was done solely to provide better access for the tympanic tube, and without regard to whether it was diseased or not. For this purpose removal of the hammer alone usually sufficed.

Undoubtedly the most radical method of cure in cholesteatoma of aditus and antrum is the chiselling of the mastoid process,—either the simple opening of the antrum, after Schwartze, or the latter in combination with resection of the upper and posterior wall of the bony meatus. This method was essentially improved by Stacke; and finally Siebenmann published a procedure by which it is possible in every case to retain an opening posterior to the auricle and to shorten the time of treatment to from 4 to 6 weeks. Combining resection of the posterior wall of the meatus with opening the antrum not only assists in removing disease products (particularly from the aditus), but gives a permanent wide opening to the diseased spaces either through the meatus or back of the auricle.

Experience up to this time has shown that the percentage of cures is higher, the stage of recovery shorter, and recurrences may be treated by conservative measures without operative procedure.

¹ *Zeitschrift f. Ohr.*, Bd. 25, S. 100.

From all available evidence it seems to us that Siebenmann's modification is to be preferred to Stacke's, particularly in large cholesteatomatous cavities; and in such patients after-effects which might result from the open cavity back of the ear have not been observed.

In some particulars we have deviated from Siebenmann's procedure. We carry the cutaneous incision only as far forward as the anterior point of insertion of the auricle, and do not carry the incision here through the periosteum. Further we chisel away the posterior wall of the meatus progressively from without inward. The skin flap, according to Schwartze, we replace by Thiersch grafts, even in large retro-auricular openings.

Drumhead and ossicles we have often allowed to remain. Caries and rarefying otitis of the ossicles appear regularly to undergo recovery under antiseptic treatment after removal of the cholesteatomatous masses, which are certainly a frequent cause of disease of these bones. We have not come to this conclusion from operated cases solely, as the numerous cases treated by the conservative method alone have been decisive.

Conclusions.—If urgent symptoms exist, chiselling of the mastoid combined with resection of the posterior meatus wall is at once undertaken. At the same time we use Siebenmann's procedure.

If urgent symptoms are wanting, injections and insufflations by aid of the tympanic tube may be employed after removal of granulations by snare or curette, should any be present. If the passage to the aditus be too narrow, the hammer is removed.

Obstinate persistence of fetor in spite of continued treatment is an indication for resection of the posterior wall, even though severe complications are wanting.

Occasional examination appears to be necessary for cholesteatoma patients,—both those having undergone operations as well as those treated by conservative methods.

CONTRIBUTIONS TO THE BACTERIOLOGY OF OTITIS MEDIA PURULENTA.

BY LEOPOLD STERN, OF METZ.

Translated by Dr. A. B. KIBBE, of Seattle, Washington.

THE number of cases of otitis media purulenta chronica which have been examined bacteriologically is, up to the present time, too small to form a clear idea of the bacteriology of this disease.

Zaufal who collected the results of all examinations up to 1891, makes this statement :

"A pure culture of any micro-organism is rarely found in the secretion of otitis media purulenta chronica; as a rule, there is a variety of bacteria, particularly in neglected otorrhœa and where the secretion is stagnant."

From all the examinations reported one fact is prominent, namely, that this disease furnishes a good culture medium for the growth of the most varied micro-organisms.

The material for this article was taken from the clinic of Prof. Bezold under his direction, and the bacteriological examinations were made in the laboratory of Prof. Emerich.

The secretion was taken from such patients only as at the time of examination were not undergoing treatment and in whom contamination of the meatus by oil, etc., could be excluded.

The discharge was taken from the tympanum with a sterilized platinum needle through a sterile speculum and transferred at once to sterile water. By aid of a cotton-wrapped probe a second specimen was next obtained and

spread on cover glasses, of which one was stained in the usual manner with aniline water, gentian violet, or carbolic fuchsin, the other by Gram's method. In a few cases, particularly those in which the secretion was very slight in amount, the material was obtained by pouring warm sterile water into the previously sterilized meatus and tympanum and collecting it again in a test tube the rim of which was again sterilized by heat.

Both methods gave analogous results. In numerous instances an agar tube was inoculated but Fraenkel's diplococcus was never found.

The present experiments, which, like those of previous investigators, failed to show any bacteria characteristic of otitis media purulenta, have in view as their main object the bacteriological character of the secretion in the various phases of this disease.

In purulent otitis media three phases may be distinguished, differing from one another by the varying character of the secretion. The latter may be :

1. Moderately or very profuse, muco-purulent, not fetid.
2. The same, but fetid.
3. Thick, partly inspissated, and fetid.

The first is characteristic of the acute attacks occurring during the course of the chronic variety.

The second, of those cases which have existed some time and in which the discharge is profuse.

The third, cases having undergone partial recovery and in which the secretion is limited to small areas.

The characteristic feature of a fresh inflammation is an odorless discharge produced by certain species of pyogenic organisms. This we find in primary acute otitis media purulenta which shows the pyogenic bacteria solely.

Finding this condition by microscopic and bacteriological examination in a case of fresh suppuration in a case of otitis media purulenta chronica which has for some time been free from discharge, one may look upon it as analogous to the primary acute form.

The following cases will illustrate this point :

CASE I.—M. K., aged five. Otitis med. pur. chron. R. L.

Left ear at present free from discharge. Occasional attacks of suppuration in both for three years. Right has been discharging for one day only. Cover-glass preparations show only cocci. On gelatine plates, staphylococcus pyogenes albus solely.

CASE 2.—H. S., aged twenty-seven. Intermittent discharge from both since scarlet fever during his first year. Right only, discharging for past three days. Discharge moderately profuse, muco-purulent, not fetid. Cover-glass preparations, some stained by Gram's method, show occasional mono-, diplo-, and staphylococci. On gelatine plates a few colonies of staphylococcus pyogenes albus. On agar nothing grew.

In both of these cases the exciting agents originated in the inflamed pharynx and gained access to the ear by way of the Eustachian tubes. The following is an example of infection through the external meatus.

CASE 3.—J. F., aged thirteen. Otitis media purulenta chronica of right ear of six months' duration during first year. Four days ago, after bathing, discharge returned. Moderately profuse, muco-purulent, and odorless. Edge of perforation covered with red, glistening granulations.

Cover-glass preparations show few bacteria, short rods, and rods of the size of tubercle bacilli, but thicker; also cocci in the form of diplo- and staphylo-cocci.

On gelatine plates and agar tubes the *bacillus coli commune* alone grew.

The positive statement of the mother that the discharge had begun but four days prior to the examination as well as the absence of fetor permits us to consider the case as an acute occurrence, opposed to which, however, the granulations must be considered. In spite of this we may consider it as a transitional form from the first to the second phase. No fetor in spite of the presence of bacilli. Probably the water played some part in producing the recurrence of suppuration. The bacterium coli commune not previously found in the ear probably gained access through the perforated drumhead by way of the external meatus. What role it played there, whether a pyogenic or that of a simple saprophyte, is uncertain. The observations made recently

in inflammations of other localities are indicative that this bacterium alone was present and that in this case the relations were reversed, rods as pathogenic and cocci as saprophytes. Pathogenic organisms may penetrate the tympanum alone or accompanied with saprophytes. If alone, they cause a suppuration analogous to the acute process. If from the beginning they are accompanied with saprophytes, or if these appear later, they find favorable products for their development which are wanting in acute suppuration. At the outset we see none; later a few rods in non-fetid secretion. The rods develop their decomposing properties even though few in number, and fetor occurs. At this time the rods, particularly the saprophytic organisms, are present in the cover-glass preparations in large number, but do not develop upon plates in connection with the pathogenic bacteria. Ultimately they overpower the latter, which disappear from the field. In acute otitis media purulenta this condition often requires months for its occurrence. In the chronic form, however, it takes place in but few days. That as a rule in acute suppuration of the middle ear the secretion remains for a long time odorless has been explained by Zaufal in part. As long as the primary excitors of the inflammation retain their full vegetative power, other pathogenic germs are unable to exist at the site of inflammation. It is only when these have lost their vitality the others gain ground. By the destruction of the primary excitors the ground is prepared for the presence of bacteria of putrefaction. It also appears that the normal or abnormal character of the mucous membrane of the tympanum as a nutritive medium for organisms should be taken into consideration, for the vegetative power of pathogenic bacteria which caused the acute recurrence of chronic middle-ear suppuration is certainly not less in the latter than in the acute form. Turning now to the cases of otorrhœa of long standing what strikes us most forcibly is the character of the microscopic preparation. We see all imaginable forms of bacteria in great number lying side by side. What is almost universal is the great preponderance of rods over cocci. The fact is remarkable that plates always gave a very simple

picture, in that usually but one, seldom two and still more seldom three varieties developed.

Even when both ears were diseased, in each side different organisms predominated, as the following cases show :

CASE 12.—L. G., age twenty-one. O. M. P. Chron. of both ears since childhood. At the present time discharge is markedly fetid, profuse, and muco-purulent.

Cover-glass preparations show in the right, diplococci and rods of various lengths. In the left, rods varying in length in great number.

Gelatine plates : in the right, but one variety of colonies, liquefying and fluorescing, composed of short rods. In the left, the plates on the following day were liquefied but showed no fluorescence.

CASE 13.—S., aged twenty-six. Discharge since six years of age, markedly fetid, muco-purulent, moderately profuse.

Cover-glass preparations : right, large number of rods, some comma forms, few cocci, among them some having capsule. Left, fewer rods than in the right, very few cocci.

Gelatine plates : those from the right which were liquefied on the second day exhibited marked feter. The rods which were found in the fluid corresponded to those in the cover-glass preparations and presented an unstained portion in the middle. The plates from the left were also markedly fetid. The colonies were liquefying and composed of rods about the size of the typhoid bacilli.

CASE 14.—J. *H., aged seventeen. O. M. P. Chron. of both since the fifth year. Moderately profuse, fetid, muco-purulent.

Cover-glass preparations : right, rods of various lengths, very few cocci. Left, rods varying in form and size, occasional comma forms, few cocci.

Gelatine plates : right, colonies of staphylococcus pyogenes aureus exceed in number a few non-liquefying colonies of rods. The left plates were liquefied on the following day.

CASE 15.—M. G., aged twelve. O. M. P. Chron. of both.

Cover-glass preparations : in the right, few cocci among numerous rods. Left, fewer bacteria than in the right, rods exceed in number the cocci, large but thinner than those in the right.

Gelatine plates : right, short rods, non-liquefying, about the size of typhoid bacilli, not pathogenic for mice. Left, also non-

C E C C B B 2 2 2
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liquefying colonies of rods slightly larger than the tubercle bacilli.

CASE 17.—A. F., aged nineteen. O. M. P. Chron. of both ears. Duration of discharge fourteen years. Moderately profuse, muco-purulent, and very offensive.

Cover-glass preparations show : right, rods varying in size, cocci questionable ; left, same appearance.

Gelatine plates : right, grayish, non-liquefying colonies, spreading out over the surface, composed of very small, thin bacilli, similar in every respect to the bacilli of fowl cholera ; left, non-liquefying colonies, closely resembling those of cholera, made up of very thin rods, slightly larger than typhoid bacilli.

CASE 19.—C. S., aged thirty. O. M. P. Chron. of left ear with perforation of Shrapnell's membrane and cholesteatoma. Discharge has existed seventeen years, moderately profuse, but not very fetid.

Cover-glass preparations show numerous bacilli, mainly of one species. Presence of cocci doubtful.

Gelatine plates : a few colonies of large cocci and liquefying colonies of bacilli.

The cultures were fetid.

CASE 20.—M. M., aged twenty-one. O. M. P. Chron. of right since the second year following scarlet fever. Discharge moderately profuse, muco-purulent, and highly offensive.

Microscopic preparation : extraordinary number of staphylococci ; a few rods, short, thick, and some slightly curved. On gelatine as well as agar, staphylococcus pyogenes albus alone grew.

In this case we have either a fresh recurrence of the primary exciters of the disease, or we must assume with Zaufal that the products of the bacteria of putrefaction were favorable to the growth of those pathogenic bacteria still present.

The last stage of otitis media purulenta chronica, characterized by the crusted, thickened, and very fetid nature of the discharge is marked by the simple character of the microscopic picture, which shows in the majority of the cases but one variety of saprophyte.

CASE 21.—J. F. O. M. P. Chron. of both. Discharge cheesy and fetid.

Cover-glass preparations from right ear show bacilli of every possible form, also beautiful vibrios and occasional cocci ; from the left, almost exclusively, fine thin rods, no vibrios, no cocci.

Gelatine plates : right, one form of non-liquefying colonies of thin, short rods, many of which are curved ; left, rapidly-liquefying colonies of very small rods. Plates exceedingly fetid.

CASE 22.—M. E., aged forty. O. M. P. Chron. of right. Markedly fœtid inspissated secretion.

Microscopic preparations show principally short rods, slightly curved ; occasional cocci.

Gelatine plates : (a) Non-liquefying colonies of slightly curved rods ; (b) grayish non-liquefying colonies of *straight rods*.

(A few cases of otitis media purulenta phthisica with bacteriological findings are reported here, though really belonging to group 2. They present no points of interest aside from the presence of tubercle bacilli in relatively great number in the discharge.)

Tabulating the bacterial findings, we find :

Known forms.	{	Staphylococcus pyogenes albus, 6 times.
		“ “ aureus, 2 “
		Streptococcus pyogenes, 3 times.
		Bacterium coli commune, 1 time.
Unknown forms.	{	<i>Bacilli :</i>
		<i>Non-liquefying :</i>
		Cultures fetid, 1.
		Cultures not fetid, 9.
		<i>Liquefying :</i>
		Cultures fetid, 4.
		Cultures not fetid, 4.
		<i>Vibrios :</i>
		Non-liquefying colonies, 4 times.
		<i>Cocci :</i>
		Non-liquefying colonies, 3 times.

Aside from tubercle bacilli, we have failed to find in the secretion from otitis media purulenta chronica any specific exciting organisms differing from those found in the acute form. The presence of saprophytes is alone characteristic of the former.

When anatomical conditions permit the complete removal of the secretion, and all diseased spaces are rendered aseptic, the cessation of suppuration and absence of fetor mark the disappearance of functional activity of the saprophytes, as repeated bacteriological examinations show.

A CASE OF EPITHELIOMA OF THE CARTILAGI-
NOUS AND CUTANEOUS MEATUS
AND AURICLE.

By DR. ALFRED DENKER, OF HAGEN.

(THIRD MEETING OF THE GERMAN OTOLOGICAL SOCIETY, AT BONN, 1894.)

Translated by Dr. A. B. KIBBE, Seattle, Washington.

GENTLEMEN: The patient which I present to you was operated on by me, February 27th of this year. The clinical history and description of the method of operating are as follows :

Mr. H., aged seventy-one, first consulted me December 15, 1891, and stated that he had been operated on for a wart in the left meatus a year ago. Since then a discharge had existed which had been unsuccessfully treated by syringing and insufflations. No history of pain.

Examination revealed an ulcerating surface on the outer half of the cartilaginous meatus about 3 square centimetres in area.

Careful antiseptic treatment producing no improvement in the spring of 1892, the diseased part was thoroughly curetted and cauterized. A few weeks later the patient was discharged, apparently cured.

Unfortunately the cure was only apparent, as he again returned several months later with an ulcer on the inferior wall, which was treated in the same manner.

Up to the end of November, 1893, two recurrences took place. In February, 1894, the character of the disease had markedly altered. The entire cartilaginous meatus was not only converted into an ulcerated surface which extended forwards and outwards

upon the skin of the helix, but the cutaneous meatus appeared now to participate in the diseased process. The entire auricle was thickened, and the entrance to the meatus narrowed by exuberant granulations. A suspicious nodule having formed in the centre of the anti-helix, and microscopic examination of the granulation tissue rendering the diagnosis of epithelial carcinoma certain, it was clear that amputation of the auricle and removal of the cartilaginous and cutaneous meatus afforded the only prospect of definite cure. The patient, to whom I had explained the necessity for removal of the auricle, at once gave his consent, and the operation was performed, February 27, 1894, in the following manner :

From the lower angle of the junction of the skin of the lobule with that of the cheek an incision was made, extending upward about 5 *cm*. With knife and scissors the anterior wall of the cartilaginous meatus was separated from the bone. A portion of the parotid having a suspicious appearance, was removed. The temporal artery was uninjured. The auricle was then included in an incision extending over the mastoid, about a centimetre posterior to its attachment, as a previous incision close to the insertion of the auricle showed suspicious-appearing tissue. The cartilaginous meatus was then divided at its union with the bony meatus. The cutaneous lining of the latter, which presented an ulcerated surface extending nearly to the drumhead, was thoroughly removed with the sharp spoon. The drumhead itself, as well as the exposed bone appeared completely normal. The wound, almost as large as a saucer, was covered in part by a large skin flap from the vicinity of the parietal bone. From the highest point of the upper border of the wound an incision was carried upward 4 to 5 *cm*, and from the upper end of this a second incision made at right angles to it and of equal length, directed backward. The flap so prepared was loosened from the underlying tissues, drawn downward and forward, and fixed with sutures. The lower edges of the wound were brought together as nearly as possible after a liberating incision downward had been made. An antiseptic dressing was then applied.

In order to cover this large surface as quickly as possible, and to maintain the meatus open, I decided at the outset to resort to transplantation of skin. March 1st a very thin flap, about 2 square centimetres, was transferred to the area exposed by the sliding parietal flap. Under silk protection it united perfectly. As the

balance of the surface of the wound, particularly in its anterior part, did not appear aseptic, further transplantation was deferred for a time.

On changing the dressing, March 3d, the borders of the cutaneous meatus showed profuse granulations, which had a suspicious appearance. Microscopic examination of some ten preparations made from scrapings revealed nothing indicative of carcinoma.

On March 11th, after thorough curetting, everything appearing healthy, two days later the entire surface was covered with Thiersch grafts taken from the patient's left upper arm—four on the bony meatus, and six on the wound surface. Two only of the ten grafts failed to unite, and were cast off,—both from the bony meatus. Complete healing, therefore, took place by granulation and later epithelial formation late in April, while the outer portions of the wound, as well as the bare bone, were firmly covered by the beginning of April. As you see, the meatus is not narrowed, and the drumhead is plainly visible.

A CONTRIBUTION TO THE STUDY OF ACUTE INFLAMMATION OF THE MIDDLE EAR PRODUCED BY THE BACILLUS PYOCYANEUS.

BY ORLANDO PES AND G. GRADENIGO, TURIN.

Translated and Abridged by AD. O. PFINGST, M.D., New York.

IT is only in the last years that we have awoke to the real significance of the bacillus pyocyaneus.

Whereas the presence of green pus was, in former years, thought to be indicative only of a localized inflammation, recent researches have shown us that the bacillus pyocyaneus may be classified with those pyogenic germs, capable of producing an infection of the entire organism.

Although we may normally find the bacillus in some of the septic cavities of the body, its presence must nevertheless be looked upon as an exceptional occurrence.

The presence of the bacillus in an abscess, fistula, diarrhoeal discharge, etc., is easily recognized by the characteristic color imparted to the pus.

It has frequently been found in the discharge coming from the ear. Maggiora and Gradenigo¹ found it in cultures made from the pus of a furuncle of the ear canal, while Gruber² and Rohrer³ were the first to cultivate it from the discharge of an acute suppurative middle ear. More thorough researches on this subject were published later by Kanthack,⁴ Martha,⁵ and Kossel.⁶

¹ Maggiora et Gradenigo: "Observ. bacter. sur le furoncle du conduit aud. ext."—*Annales de l'Institut Pasteur*, v.

² Gruber, J. *Monatschrift f. Ohrenheilk.*, 1887.

³ Rohrer. *Zur Morphol. der Bakterien des Ohres*, Zurich, 1889.

⁴ Kanthack. *These ARCHIVES*, xxi., 1891.

⁵ Martha. "Note sur deux cas d'otit. m. purulente contenant le bacille pyocyanique à l'état de purté."—*Archives de méd. expériment. et d'anatomie pathol.*, 1892, p. 130.

⁶ Kossel: "Zur Frage der pathogenität des Bacillus pyocyaneus."—*Zeitschrift für Hygiene*, xvi., 1894.

Kossel: "Ueber mittelohreiterungen bei Säuglingen."—*Charité-Annalen*, xviii.

Kanthack found that the bacillus was virulent only when in combination with pathogenic cocci.

We will briefly review two cases in which, among several suppurations of the middle ear following influenza, we were able to make cultures of the bacillus pyocyaneus.

CASE 1.—C.L., a carpenter, thirty-three years old, in whom a supuration of the middle ear of both sides appeared ten days after an attack of influenza. When he came under our observation—twenty days after spontaneous rupture of both drums—the membrana tympani was very much injected. The scanty discharge had a decided green color.

Microscopically we found the pus of both ears to contain, besides the pus corpuscles, bacilli of a uniform size and shape.

Examinations of the pus on subsequent days always revealed the presence of the same micro-organisms.

We isolated the bacillus in beef-tea cultures, carried out under the ordinary precautions, and by its morphological structure recognized the bacillus pyocyaneus.

CASE 2.—B. L., a peasant, fifty-two years of age, whose general condition was very poor. After an attack of influenza, of fifteen days' duration, he experienced a severe pain in his left ear, without any otorrhœa. When we saw the patient, some days later, he still complained of pain in his ear and of deafness.

The drum membrane was intact, but was tense and decidedly injected.

A paracentesis was made, the extruding pus being immediately examined microscopically.

We could only detect cocci, which were of a uniform size, some being arranged in heaps as staphylococci, others in pairs as diplococci, while some isolated ones were scattered about between the pus and epithelial cells.

In beef-tea or plate cultures, on the other hand, we invariably found the bacillus pyocyaneus. To exclude the possibility of their having been introduced from without during our manipulation, we repeated the examination several times. The results were identical. We also took the precaution to close the ear with an aseptic dressing, to exclude it from external contaminations.

Owing to the characteristic properties of the bacillus pyocyaneus its detection is not very difficult.

It imparts a green color to beef tea, at 37°, in twenty-four hours, which increases in intensity in the following days. A delicate tenacious pellicle forms on the surface. After about three months the color changes to an olive green. In the tube cultures the gelatine rapidly liquefies, taking on at the same time a bright greenish-blue color.

At the junction with the unchanged gelatine, a yellowish white crumbling substance is deposited. The color gradually goes over into a bright orange, which by reflected light appears green and opalescent.

New inoculations, made from the culture at this stage, take on the original greenish-blue color.

The gelatine of the plate cultures also liquefies rapidly and takes on a beautiful fluorescence.

On agar the bacilli grow in round colonies, which become surrounded by white or smoky rings, while the entire surface of the agar appears green and opalescent.

While some of the cultures emit a most disagreeable odor, that emanating from the plate cultures is rather pleasant.

In recapitulating briefly we see that the bacillus pyocyaneus is capable of producing an infection of the entire organism. Furthermore that local inflammations produced by the same are frequently found in the ear. The bacillus is always capable, though changed in appearance by artificial culture, of setting up a localized diseased condition.

EXAMINATION OF THE DURATION OF HEARING
THROUGHOUT THE MUSICAL SCALE IN DIS-
EASES OF THE INTERNAL AND MIDDLE
EAR.

BY DR. BORIS WERHOVSKY, OF ST. PETERSBURG, RUSSIA.

(With 27 curves on Plates I., II., III., of Vol. XXVIII. of German Ed.)

Translated by Dr. H. A. ALDERTON, of Brooklyn.

WITHOUT considering the diseases of the internal ear, which because of their deep situation are inaccessible to direct investigation, we are unable also in a large number of middle-ear diseases, "without the assistance which the hearing test offers to differential diagnosis, to recognize in many of the cases the character of the affection" (BÜRKNER¹). Above all, in the investigation of the hearing organ, the consideration that the same "offers a peculiarity, which gives it an advantage over the other organs of sense," because in its functional test two ways can be considered by which the sound waves can attain to the perceiving apparatus, namely, both by air conduction and by bone conduction (BEZOLD²).

Insight into the significance of functional examination does not belong exclusively to modern times. On the contrary, the different methods of investigating have occupied for a long time a great number of authors; we owe to them a series of methods of examination which have proved useful for clinical purposes. Concerning the value of physical examination of the ear in general, which recently has been

¹ See Bibliography at end of article.

repeatedly doubted, I like to quote the words of GRADENIGO, that "the errors of the test of the hearing function occurring alone, through the physical qualities of the sources of sound and of the locality of the examination, are limited as compared with the sources of error resulting from the psychical condition of the individual examined; they are so trifling, that we have no cause to complain of the want of greater exactness from the physical standpoint."

HARTMANN⁴ was the first to give graphic representations for a continuous series of tones by air conduction (A. C.) and bone conduction (B. C.), and placed the results of both tests on the diseased ear in juxtaposition for comparison. Hartmann used in his investigation the following forks: c (128 d. v.), c^1 (256), c^2 (512), c^3 (1024), and c^4 (2048). The normal average duration of hearing for each of these forks in seconds was determined by testing four cases with normal hearing, and the numbers in seconds obtained in hard-hearing people registered graphically, in relative percentages of the time of normal hearing, on the diagram, which is divided into one hundred parts.

Hartmann adduces four types of hardness of hearing from the results obtained:

Type I.—Nearly uniform lowering of the duration of hearing by A. C.

(a) with good hearing through the bones (middle-ear diseases).

(b) with poor hearing through the bones (labyrinth diseases).

Type II.—Bad hearing of the deep, progressively better of the high, tones. Better hearing by B. C. than by A. C., especially for the deep tones (sclerosing processes of the middle ear, especially with ankylosis of the stapes in the oval window and otitis media purulenta residuosa).

Type III.—Good hearing of the deep, progressively poorer for the high, tones. Lowered hearing by B. C., especially for the high tones (in boiler-makers, artillerists, and other pathological processes of the nervous apparatus).

Type IV.—Irregular perception of the different heights of tone, by A. C. as well as by B. C. (where the disease does

not affect the nerve apparatus uniformly throughout, or where there is coincident disease of the sound-conducting apparatus).

GRADENIGO⁵ employed, for the differential diagnosis of the ear diseases, the method of Hartmann with one modification. Besides the tuning-forks, which Hartmann had selected for his investigations, Gradenigo added also tuning-forks C (64) and c⁵ (4096). He ignored entirely the testing of the duration of perception of the individual tones by B. C., and recommended that the time during which the normal ear heard the fork longer than the diseased ear be measured and not the duration of hearing of the patient. The duration of hearing in the diseased ear can then be found by subtraction, the number of seconds so obtained reckoned as usual in percentage to the normal hearing time. The percentage so reckoned Gradenigo represents graphically the same as Hartmann. As a result of his investigations, Gradenigo came to the conclusion that there is found always in diseases of the sound-conducting apparatus a more or less progressive lowering of the acuteness of hearing from the high to the deep tones, and that this is completely reversed in diseases of the internal ear. In diseases of the acoustic nerve, Gradenigo says there is diminished perception for the middle tones, whilst the perception for the high tones is relatively well maintained.

Gradenigo's modification of Hartmann's method does not depend upon the intensity of the stroke given to the tuning-fork, and this is a great advantage over Hartmann's method; also, as a result, the perceiving apparatus is less exhausted.

BEZOLD⁶ has already used this method for years.

If it is in one way an advantage that Gradenigo needs more tuning-forks than Hartmann, it is in other ways incomprehensible why he completely ignored the testing of the duration of perception of the different tones. In another article GRADENIGO⁷ writes that such a testing "inclines to too many complicative factors." The execution of this test with very deep and very high tuning-forks is certainly practically an impossibility, the patient being hardly able to differentiate between the feeling of the mechanical vibration

of the deep tuning-fork when in place and the perception of its tones; with the high tuning-forks "already with forks above a² the isolation of the B. C. will not admit of proof, these forks being so intense and their rhythm being audible to such a distance through the air, that it is impracticable to exclude the A. C." (BEZOLD⁵). But in no case are we authorized to deem the testing by B.C. with forks of middle register superfluous. From the numerous writings of Bezold and from my own investigations it follows that very important and very instructive results, bearing upon the differential diagnosis of ear diseases, are obtained through the determination of the duration of perception of the tuning-fork of middle register by B. C., and the comparison of the same with that by A. C.

Very recently, ALDERTON⁹ has published very extensive investigations as to the duration of perception of different tones by A. C. and B. C. He used in his examinations Hartmann's series of tuning-forks. The difference of his method from that of Hartmann consists only in the fact, that he denotes the duration of perception of the different tones by the number of seconds during which the patient perceived the tone of each fork when in position. It is to be regretted that Alderton did not present the results obtained by him according to the graphic percentages of Hartmann. Alderton himself gives no reason for this innovation; he only says that to him the method of Hartmann appears "to be too difficult and misleading," and "every investigator learns quickly the normal re-actions of his own tuning-fork set, and can then use it easily for comparison." Yet it appears to me that the rich material obtained by Alderton would have gained in value if he had presented the same according to Hartmann's method, for only in the latter way a direct comparison of the results is possible.

If one puts the forks in vibration with free hand, one can never be sure that every time a uniform strength of stroke is obtained. And this is a source of error also in the original method of Hartmann. This error by maximum stroke of the fork can be almost quite neglected, but it is quite another thing with the sort of stroke used in the investiga-

tion by Alderton, who compares the tone produced "through a light stroke upon the bent knee," with the result "of a c^4 fork put in vibration through a stroke on a thick piece of rubber." Thereby is also explained perhaps the apparent contradiction, noticeable in some numbers, in so far as many patients of Alderton heard one and the same tone (c^1) better through the air than the thirty-six men who had "absolutely normal ears." While we also know that since the investigations of Bezold and of Schwabach, that an increase of B. C. is returned as a regularly constituted symptom in certain diseases of the ear, so it is yet hardly possible in any case to say the same of the increase of A. C. One could always think here of a hyperæsthesia of the acoustic. It is very doubtful, however, that the hyperæsthesia itself should always be limited in all patients to one and the same tone (c^1) only.

Bezold has up to the present in his clinical investigations considered mostly only the lower- and upper-tone limits, the existence or absence of A. C. in the course of the scale, and the duration of B. C. for individual tuning-forks (A, a, a^1): In answer to the long-expressed wish of Bezold, that also an exact determination of time of A. C. for the whole course of the tone series be obtained in a great number of cases, I have completed in this direction the functional investigation of a great number of patients.

All cases submitting to my investigation were first functionally tested by Bezold, or, as occurred in four cases (2, 6, 13, and 20), by his assistant, Dr. Arno Scheibe, in order to determine the diagnosis, and then kindly turned over to me for further testing. Moreover, I selected, as suggested by Bezold, with one exception (Case 27), only typical cases for my examination, *i.e.*, only such as presented one form of disease and not a combination of diseases. I have examined twenty-six typical cases, eleven of sclerosis of the sound-conducting apparatus, fourteen of disease of the sound-perceiving apparatus, and one of traumatic rupture of the tympanic membrane. In one case there was found, besides a bilateral disease of the internal ear, a depressed cicatrix upon one side from a previous middle-ear suppuration.

Concerning the functional testing of the diseased ear the reader is referred to "*Survey of the Present Condition of Otol-ogy*," by Bezold,¹⁰ in which the foregoing is exactly presented.

I have employed Hartmann's method, as did Gradenigo, not in its original form, but with the following modification. For measuring the duration of perception of the different tones I did not use Hartmann's series, which consists only of five tuning-forks, but the following nine tuning-forks :

A ²	26.66	d. v. s.	(double vibrations a second).
A ¹	53.33	" "	
A	106.66	" "	
a	213.33	" "	
a ¹	426.66	" "	
a ²	853.33	" "	
f ³	1365.28	" "	
c ³	2018	" "	
fis ⁴	11,000	" "	

For the determination of the duration of perception by B. C., I limited myself to three tones of middle register, and therefore used only the tuning-forks A, a, and a¹. To express in seconds the duration of perception of the patient for the different tones conducted from the vertex, I found out, as Bezold has always done since the beginning of his tuning-fork experiments, not the total time during which the tone of the fork was perceived by the patient, but just the difference between the duration of B. C. for the patient and for the observer. If the tone of the tuning-fork was not again heard when instantly placed upon the vertex of the observer, after having died out while on the vertex of the patient, then the difference between the investigator and investigated = 0, and the duration of B. C. was indicated with 1.0, *i. e.*, normal. If the duration of B. C. in the investigated person was shorter, its value was less than 1.0, and in the opposite case greater than 1.0. The decimals, according to our own duration of B. C., are indicated for each tuning-fork. In the same way in testing the A. C., the time

during which the tuning-fork was heard longer by the investigator than by the patient was compared with the duration of hearing for the same tuning-fork by our own normal ear, and the impairment of hearing in percentage of my own duration of hearing indicated. For example, if the A-fork, its tone having been elicited by a strong stroke, is held nearly in touch with the auricle, and is perceived by me for eighty seconds long, and is heard by me forty seconds longer than by the patient, then the duration of hearing for the patient for the same tone was also forty seconds, and his relative percentage to the normal duration of hearing is calculated after the following simple formula :

$$40 : 80 = x : 100.$$

$$x = 50 \%$$

In like manner was calculated the percentage of the duration of the B. C. of the patient to the normal, only the normal value of the latter was indicated as 1.0 and not as 100.0.

Each measurement was several times repeated, and every time the average of the collective measurements stated.

After many trials the duration of hearing of my own ear for each tuning-fork was provisionally fixed. Through A. C. I heard :

The tuning-fork A² 60 seconds.

A ¹	75	"
A	80	"
a	80	"
a ¹	100	"
a ²	114	"
f ³	75	"
c ⁴	75	"
fis ⁴	22	"

From the vertex I perceived the tone of the

A fork 24 seconds.

a	"	20	"
a ¹	"	12	"

The duration for each tuning-fork measured by A. C. as well as B. C. is presented graphically for each individual case in Tables I-III.

CASES.

Sclerosis of the Sound-Conducting Apparatus.

CASE 1, No. 554.¹—Theresa F., fifty-four years old. For four years gradually increasing hardness of hearing, at times tinnitus and vertigo. A brother is hard of hearing through the use of explosives—*Mt*: right, normal; left, slightly diffusely thickened.

Whisper, { right, 7 m,
 { left, 30 cm.

Lower tone limit, { right, 19.5 d. v. s. (the deepest tone
 { tested).
 { left, G¹.

"A" fork upon vertex in poorer left ear + 17 seconds,

"a¹" " " " " " " " + 7 "

Rinné a¹, { right, + 20 seconds,
 { left, - 14 "

Edelmann-Galton Whistle,² { right, 1.1,
 { left, 1.3.

Catheterization on the left side penetrates with a moderately strong, continuous, smooth stream, and did *not* improve.

CASE 2, No. 530.—Anna W., twenty-one years old. For two years headache, for one year constant tinnitus, for nine months hardness of hearing noticed on right side. No vertigo, no heredity. Both *Mt* somewhat less transparent, right periphery more markedly thickened, otherwise normal. Right nasal fossa narrowed by deviation of the septum; left inferior and middle turbinates hypertrophied anteriorly. On the right tube mouth above a small, yellowish protuberance; otherwise no changes of the tube mouths.

Whisper, { right, 6 m ("drei" and "neun").
 { left, 7 m.

Lower-tone limit, { right, F,
 { left, 21 d. v. s.

"A" fork heard from vertex in diseased ear + 13 seconds.

"a¹" " " " " " " " + 5 "

Rinné a¹, { right, + 8 seconds,
 { left, + 31 seconds.

E. G. Whistle, both sides, 1.2.

¹ The numbers refer to the Dispensary journal of the year 1895.

² Usually heard in the normal ear at 1.1.

for one year, and hardness of hearing; no heredity; at times vertigo.

Examination in 1893. Both *Mt* normal. Catheterization penetrated right in indistinct, left in weak continuous stream, but did not improve hearing.

Whisper, { right, 20 *cm* ("funf"),
 { left, 18 *cm* ("neun").

Lower-tone limit, { right, F,
 { left, D.

"A" fork upon vertex + 17 seconds.

"a¹" " " + 5 "

Rinné a¹, { right,—8 seconds,
 { left,—7 seconds.

Examination in 1895, the right *Mt* in posterior half slightly diffusely reddish, transparent.

Whisper, { right, 18 *cm* ("funf" and "neun"),
 { left, 20 *cm* ("vier" and "sechs").

Lower-tone limit, { right, F,
 { left, H,

B. C. and Rinné's test as in 1893. E. G. whistle, both sides, 1.1.

Catheterization penetrated in right in moderate, left in weak continuous stream; the hearing on the right was not changed, the left was made worse for the whisper to 15 *cm*.

CASE 6, No. 537.—Anna J., thirty-four years old. Hardness of hearing for one year; tinnitus, no dizziness, no heredity. Both *Mt* typically normal.

Whisper, { right, 65 *cm* ("neun"),
 { left, 40 *cm* ("neun").

Last year the hearing for the whisper was: right, 30 *cm* ("acht"); left, 35 *cm* ("neun"). The hearing was improved to the above degree after a month's visit to the mountains.

Lower-tone limit, { right, G₁,
 { left, C₁.

"A" fork upon vertex + 10 seconds.

"a¹" fork upon vertex ± 0 seconds.

Rinné a¹, { right,—8 seconds,
 { left,—10 seconds.

E. G. Whistle, both sides, 1.1.

Catheterization penetrated on right side in weak, on left in moderate continuous stream. Paracosis Willisii.

CASE 7, No. 391.—Erwin N., twenty-two years old. Noticed hardness of hearing in the winter of last year. That gradually disappeared of itself. Hardness of hearing again appeared for past two months, without tinnitus, vertigo, or heredity. Both *Mt* normal; on left a light reflex, showing convexity in the upper posterior periphery. The tube mouths unchanged, except for a large vessel on each side, which ran along the inner wall of the mouth of the tube. Moderate quantity of adenoid vegetations on the naso-pharyngeal roof, without irregularities.

Whisper, $\left\{ \begin{array}{l} \text{right, } 7 \text{ m } <, \\ \text{left, } 60 \text{ cm ("vier" and "sechs").} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } 19\frac{1}{2} \text{ d. v. s. (the lowest tone tested),} \\ \text{left, } \text{Gis}_1. \end{array} \right.$

"A" fork upon vertex in the poorer left ear + 4 seconds,

"a¹" fork upon vertex in the poorer left ear, ± 0 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, } + 23 \text{ seconds,} \\ \text{left, } - 7 \text{ seconds.} \end{array} \right.$

E. G. Whistle, both sides, 1.1.

Catheterization penetrated left in moderate stream, without change.

CASE 8, No. 501.—Josefine P., twenty-six years old. Tinnitus for two years; no dizziness. Mother is hard of hearing. Both *Mt* typically normal. Pharyngeal tube mouths strikingly small; otherwise unchanged.

Whisper, $\left\{ \begin{array}{l} \text{right, } 10 \text{ cm ("neun")}, \\ \text{left, } 25 \text{ cm ("neun")}. \end{array} \right.$

Lower-tone limit, both sides, F₁.

"A" fork upon vertex in the poorer right (uncertain) + 12 seconds.

"a¹" fork upon vertex in the poorer right (uncertain) — 3 seconds.

Rinné a¹, both sides, — 9 seconds.

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, } 1.1, \\ \text{left, } 1.2. \end{array} \right.$

Catheterization penetrated with strong continuous stream, without perceptible improvement.

CASE 9, No. 396.—Max S., fifty-two years old. Hard of hearing since 1870. For three years constant tinnitus; no dizziness, no heredity. Both *Mt* typically normal.

Whisper, $\left\{ \begin{array}{l} \text{right, } 3 \text{ cm ("vier" and "acht")}, \\ \text{left, uncertain.} \end{array} \right.$

Lower-tone limit, both sides, F.

"A" fork upon vertex (Weber experiment unusable), + 11 seconds.

"a¹" fork upon vertex (Weber experiment unusable) \pm 0 seconds.

Rinné a¹, { right, — 9 seconds,
left, — 12 seconds.

E. G. Whistle, { right, 1.1,
left, 1.2.

Catheterization penetrated on both sides in moderate continuous stream, without perceptible improvement.

CASE 10, No. 432.—Monika B., forty-seven years old. Tinnitus at times for two years, and hardness of hearing on the right side. Both *Mt* slightly diffusely thickened. Otherwise normal. No dizziness; father hard of hearing.

Whisper, { right, 6 cm ("vier"),
left, 4 m ("sechs" and "sieben").

Lower-tone limit, { right, E,
left, d. v. s.

"A" fork upon vertex in the poorer right + 6 seconds.

"a¹" " " " " " " — 2 seconds.

Rinné a¹, { right, — 11 seconds,
left, + 17 seconds.

E. G. Whistle, { right, 1.4,
left, 1.1.

Catherization penetrating in a continuous stream.

CASE 11, No. 387.—Iwan W., thirty-two years old. Deafness for speech for eight years, constant tinnitus. Both *Mt* of normal conformation, right diffusely reddened in the whole anterior half, and in the posterior inferior quadrant.

Conversational speech, { right, most of the Russian numbers
were understood.
left, deafness for speech.

Lower-tone limit, { right, fis¹, by all the tuning-forks up to fis⁴
inclusive.¹
left, only fis⁴ heard of all the tuning-forks.

"A" fork upon vertex uncertain as to which ear, + 7 seconds.

"a¹" " " " " " in right (only upon strong stroke) — 12 seconds.

¹ The unclamped a¹ fork was only heard one moment per air, and therefore it does not appear in the graphic presentation.

They were better heard on the mastoid process.

Rinné a¹, { right, — 12 seconds,
 { left, — 12 seconds.

E. G. Whistle, { right, 2.9,
 { left, 6.2.

Blowings (?) on the whistle not heard on either side. Both f⁶ and f² organ pipes were well heard on the right side, left lower-tone limit in the organ pipe g⁴.

Nerve Deafness.

CASE 12, No. 487.—Joseph N., ten years old. Hardness of hearing for six months, especially on the right side. No heredity, no dizziness, at times tinnitus. Both *Mt* typically normal. Eyes and teeth normal. Healthy appearance.

Whisper, { right, 8 cm ("vier" and "funf"),
 { left, 18 cm ("vier").

Lower-tone limit, both sides, 16 d. v. s.

"A" fork upon vertex better in the left — 13 seconds.

"a" " " " " " " — 12 seconds.

"a¹" " " " not heard.

Rinné a¹, { right, + 26 seconds,
 { left, + 16 seconds.

E. G. Whistle, { right, 1.1,
 { left, 1.2.

Catheterization penetrated on both sides in continuous moderate stream, without altering hearing range.

CASE 13.—Johann R. (examined by Dr. Scheibe), forty-seven years old. In the railway service for thirteen years; hit on the left ear ten years before; yet patient neither at that time nor since has noticed that he is hard of hearing. Tinnitus and dizziness are absent. Both *Mt* normal.

Whisper, { right, 5 m } (both sides "fünf," "sechs," and
 { left, 60 cm } "sieben".)

Lower-tone limit, both sides, 16 d. v. s.

"A" fork upon vertex better in right, — 2 seconds.

"a¹" " " " " " " — 6 seconds.

Rinné a¹, { right, + 19 seconds,
 { left, + 21 seconds.

E. G. Whistle, both sides, 1.1.

Catheterization penetrated both sides in moderate normal stream, without improvement.

CASE 14, No. 513.—Leopold S., forty-three years old. Constant tinnitus on left side for one year. No heredity, no dizziness. Patient noticed hardness of hearing for six months. Both *Mt* moderately diffusely thickened. Manubrium broadened.

Whisper, { right, 2 *m* ("fünf" und "sieben"),
 { left, 2½ *m* ("sieben").

Lower-tone limit, both sides 19.5 d. v. s. (deepest tested tuning-fork.

"A" fork upon vertex + 0 seconds,

"a¹" " " " — 9 seconds.

Rinné a¹, { right, + 26 seconds,
 { left, + 28 seconds.

E. G. Whistle, both sides, I.I.

CASE 15, No. 320.—Joseph Z., eleven and three-fourth years old. Measles about four years before, since then hardness of hearing, but did not perceptibly increase. Both sides posteriorly, strands of thickening, and on right diffuse thickening of the *Mt*, with the exception of the anterior superior quadrant; above the right short process a small light reflex.

Whisper, { right, 40 *cm* ("vier," "acht"),
 { left, 30 *cm* ("acht").

Lower-tone limit, both sides, 16 d. v. s.

Rinné a¹, { right, + 15,
 { left, + 17.

E. G. Whistle, both sides, I.I.

CASE 16, No. 448.—Johann S., fifty-four years old. Locomotive engineer for thirty years. Hardness of hearing for three years, beginning gradually and then remaining stationary. No tinnitus, no dizziness, no heredity. Both *Mt* typically normal.

Whisper, { right, 10 *cm* ("vier," "neun"),
 { left, 12 *cm* (" ").

Lower-tone limit, both sides, 27 d. v. s.

"A" fork upon vertex, — 10 seconds.

"a" " " " — 15 seconds.

"a¹" " " " not heard, nor from the mastoid process.

Rinné a¹, both sides, + *t*.

E. G. Whistle, both sides. I.I.

CASE 17, No. 482.—Christian R., thirty-seven years old. For two years constant tinnitus on the left side, occasional tinnitus on

the right; the left was very loud and described as a waterfall. For three months attacks of dizziness, so that he must hold on to something, and vomiting. No heredity. Both *Mt* normal, left hammer somewhat more horizontal. In the last week an attack of psychosis.

Whisper, $\left\{ \begin{array}{l} \text{right, } 1\frac{1}{2} m, \\ \text{left, } 2 cm. \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } D_1, \\ \text{left, } G_1. \end{array} \right.$

"A" fork upon vertex in better right, — 8 seconds.

"a¹" fork neither upon vertex nor on mastoid process heard.

Rinné a¹, both sides, + 2.

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, } 1.1, \\ \text{left, } 1.2. \end{array} \right.$

Catheterization penetrated both sides in moderately continuous streams.

CASE 18, No. 464.—Fanny M., forty-nine years old. Cerebral syphilis, weakness of memory, eruption. When patient was a little girl, one child in the family, as also her mother, had syphilis. At times tinnitus, continuous disturbance of co-ordination. The right *Mt* showed an irregular circumscribed dark spot in the posterior half, otherwise normal. Left manubrium somewhat broadened. Strands of thickening posteriorly, with prominent posterior fold.

Whisper, $\left\{ \begin{array}{l} \text{right, } 35 cm, \\ \text{left, } 3 cm. \end{array} \right. \left\{ \begin{array}{l} \text{both sides "fünf."} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } 21 d. v. s., \\ \text{left, } 22.5 d. v. s. \end{array} \right.$

"A" fork upon vertex in the left ± 0 .

"a" fork upon vertex in the left — 14.

"a¹" fork upon vertex not heard.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, } + t, \\ \text{left, } + 17 \text{ seconds.} \end{array} \right.$

E. G. Whistle, both sides, 1.2.

Catheterization penetrated left side in indistinct stream.

CASE 19, No. 477.—Johann R., seventy years old. Afflicted with hardness of hearing at least one and a half years. At times tinnitus, dizziness on blowing the nose, no heredity. Ardent gunner and target shooter. Both *Mt* normal.

Whisper, $\left\{ \begin{array}{l} \text{right, } 15 cm \text{ ("sieben")}, \\ \text{left, } 2 cm \text{ (all members apparently alike).} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, 25 d. v. s.} \\ \text{left, 22 d. v. s.} \end{array} \right.$

"A" fork upon vertex uncertain in which, — 8 seconds.

"a¹" fork upon vertex in the right, — 10 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, + 24 seconds.} \\ \text{left, } \pm 0 \text{ seconds.} \end{array} \right.$

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, 3 6,} \\ \text{left, 2.9.} \end{array} \right.$

CASE 20. No. 559 — B. K., thirty-six years old. Two years before, bursting of gun, after which temporary singing and since then slight hardness of hearing on the right side. More marked hardness of hearing and constant singing on both sides for three months. No dizziness, no heredity, both *Mt* slightly diffusely thickened. Both reflexes only intensified.

Whisper, $\left\{ \begin{array}{l} \text{right, 2 cm,} \\ \text{left, 8 cm,} \end{array} \right. \left\{ \begin{array}{l} \text{all numbers the same.} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, 25 d. v. s.} \\ \text{left, 19.5 d. v. s (lowest tested tone).} \end{array} \right.$

"A" fork upon the vertex, — 7 seconds.

"a¹" fork upon the vertex not heard.

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, 1.2,} \\ \text{left, 1.1.} \end{array} \right.$

Catheterization penetrated right in broad, left in moderately normal stream, without improvement.

CASE 21, No. 504. — Joseph Z., thirty-three years old. For two years, after use of salicylates, dizziness and tinnitus. Both *Mt* diffusely thickened and without reflexes. Formerly had occasional, now constant dizziness. Yesterday a more marked attack of vertigo.

Whisper, $\left\{ \begin{array}{l} \text{right, 15 cm ("sieben").} \\ \text{left, uncertain.} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, 25 d. v. s.} \\ \text{left, G}_1. \end{array} \right.$

"A" fork upon vertex in the better ear, — 7 seconds.

"a¹" fork upon vertex in the better ear, — 5 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, + 23 seconds.} \\ \text{left, } \pm 0 \text{ seconds.} \end{array} \right.$

E. G. Whistle. $\left\{ \begin{array}{l} \text{right, 1.1,} \\ \text{left, 5 6.} \end{array} \right.$

Catheterization penetrated right with moderate, left in strong continuous stream, without improvement. Therapy: pot. iod.

CASE 22, No. 516.—Michael D., twenty-five years old. Hardness of hearing for two years, tinnitus for one year, no dizziness. Uncle on maternal side hard of hearing. In 1891, a gun was shot off beside his left ear. Both *Mt* slightly diffusely red and translucent. Thickening of the intermedial zone upon the left side.

Whisper, { right 8 cm ("funf" "seben"),
 { left uncertain ("vier").

Ordinary conversation, left, $3\frac{1}{2}$ m. ("drei").

Lower-tone limit, both sides, 19.5 d.v.s. (the deepest tested tone).

"A" fork upon vertex (Weber test unusable) — 5 seconds.

"a¹" fork upon vertex (Weber test unusable) — 8 seconds.

Rinné a¹, { right, + 24 seconds,
 { left, + 10 seconds.

E. G. Whistle, { right, 3.7,
 { left, 3.4.

CASE 23, No. 483.—Magdelina G., seventy-eight years old. Marked impairment of hearing for five to six years. No heredity, at times tinnitus, formerly (ten to eleven years ago) marked dizziness, so the patient must hold on something. Right *Mt* strands of thickening posteriorly with prominences of the posterior fold. Thickening of the intermedial zone. Left *Mt* the same. Hearing trumpet does not improve the hearing.

Whisper, { right, 3 cm ("sieben"),
 { left, uncertain, (excepting "sieben").

Ordinary conversation, { right, 60 cm ("neun" and "sieben")
 { left, 20 cm ("fünf").

Lower tone limit, { right, G¹,
 { left, F¹.

"A" fork upon vertex uncertain in which — 10 seconds.

"a" and "a¹" forks not heard upon vertex or mastoid.

Rinné a and a¹, both sides, + t.

E. G. Whistle { right, 6.5,
 { left, 7.4, no hiatuses.

Catheterization penetrated right in continuous stream, left not distinctly audible.

CASE 24, No. 443.—Marie G., eighteen years old. Hardness of hearing suddenly appearing five years before. A sister is hard of hearing. On left side constant tinnitus, occasional dizziness and considerable headache. Both *Mt* normal.

Whisper, { right, 3 *cm* ("drei", "vier" and "sieben"),
left, not heard.

Conversational speech, { right, 10 *cm*. (All numbers apparently
alike.)
left, not heard, also did not hear
shouted words.

Lower-tone limit { right, 27 d. v. s.
left, only *c*⁴ strongly struck and *fis*⁴ moderately struck.

In the organ pipes lower-tone limit *b*³.

"A" fork upon vertex in the better right ear, — 5 seconds.

"a" fork upon vertex in the better right ear, — 9 seconds.

"a¹" fork upon vertex not heard.

Rinné *a*¹, { right, + t,
left, could not be tested.

E. G. Whistle, { right, 2.9,
left, 4.6.

Right heard the blowing, left not heard.

CASE 25, No. 564.—Notburga H., thirty-four years old. Examination March 3, 1893, whisper both sides 2 *m* ("neun").

Both *Mt* show a fold running directly backwards from the short process with opaque stripes, more marked on the left side. Left shows two small extravasations of blood, one in front of the short process, the other in the posterior superior periphery; otherwise both *Mt* are normal. No heredity. Tinnitus in right since October and in the left since Christmas. Vertigo also for the same time, constant for the past fourteen days. Simultaneously headache.

Catheterization, accomplished in a sitting posture, penetrated both sides, in moderate continuous stream, only that the patient reeled or complained of marked subjective vertigo, without improvement. The patient goes about heavily but no staggering was noticed. Medication: quinine.

Dec., 3*d.*—The tinnitus assumed another character since the administration of quinine, without becoming perceptibly stronger. Because of inclination to vomit the patient cannot remain long out of bed. In place of the blood extravasation in the posterior superior periphery appears to-day a small atrophic spot.

Whisper, { right, 2 *m*,
left, 1 *m*.

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } A_1, \\ \text{left, } D. \end{array} \right.$

"A" fork upon vertex ± 0 .

"a" and "a¹" forks heard neither on vertex nor mastoid.

Examination, Aug. 23, 1895.—After lasting half a year all troubles vanished and also the hearing became better. Eight days before, vertigo appeared with vomiting, tinnitus, and hardness of hearing. Condition of *Mt* the same as in 1893.

Whisper, $\left\{ \begin{array}{l} \text{right, } 80 \text{ cm ("acht"),} \\ \text{left, } 4 \text{ m (uncertain statement).} \end{array} \right.$

Lower-tone limit, $\left\{ \begin{array}{l} \text{right, } C, \\ \text{left, } A_1 \text{ (sharply limited).} \end{array} \right.$

"A" fork upon vertex in the better left — 17 seconds,

"a¹" fork upon vertex in the better left — 8 seconds.

Rinné a¹, $\left\{ \begin{array}{l} \text{right, } + 8 \text{ seconds (upon right mastoid heard in} \\ \text{the left),} \\ \text{left, } + 23 \text{ seconds.} \end{array} \right.$

E. G. Whistle, $\left\{ \begin{array}{l} \text{right, } 1.2, \\ \text{left, } 1.2. \end{array} \right.$

Aug. 25, 1895.—

Whisper, $\left\{ \begin{array}{l} \text{right, } 80 \text{ cm ("acht").} \\ \text{left, } 6 \text{ m } < \end{array} \right.$

Catheterization penetrated on right in thin, on left in broad continuous stream, with improvement on the right to $1\frac{1}{4}$ m.

Sept. 3, 1895.—

Whisper, $\left\{ \begin{array}{l} \text{right, } 1\frac{1}{4} \text{ m,} \\ \text{left, } 6 \text{ m.} \end{array} \right.$

Gellé's test upon vertex with "A" fork positive on both sides.

Traumatic Rupture of the Mt.

CASE 26, No. 584. — Joseph J., twenty-seven years old. Patient was struck twelve years before on the right ear by a fragment of a wood hammer, after which he was dazed for a moment. On the day of the injury he became also hard of hearing, nominally bilateral. A couple of days later moderate tinnitus appeared, which still persists. No vertigo. On blowing the nose air penetrated through the right ear. Patient has allowed the water to flow into the ear every day, in spite of which no discharge has appeared. Left *Mt* normal, right exhibits an irregularly shaped extravasation running from the anterior superior to the posterior inferior quadrant, in whose anterior portion in the anterior superior quadrant lies a sharply limited circular perfora-

tion of about 1 mm in diameter. In the inferior anterior quadrant of the *Mt* a white strand of thickening, concave anteriorly.

Whisper, { right, 1 m ("funf"),
 { left, 7 m < ("hundert").

Lower-tone limit, { right, F_1 ,
 { left, d. v. s.

"A" fork upon vertex in diseased right + 20 seconds,

"a" fork upon vertex in diseased right + 10 seconds,

"a¹" fork upon vertex in diseased right + 7 seconds.

Rinné a¹, { right, + 15 seconds,
 { left, + 25 seconds.

E. G. Whistle, both sides, 1.1.

The air penetrated by Politzer's and Valsalva's experiments, in deep blowing continuous stream.

Bilateral Nerve Deafness.

With cicatrix in right, the result of a middle-ear suppuration cured in childhood.

CASE 27, No. 592.—N. G., thirty-one years old. Discharged, for about three months, in his sixteenth year. Hardness of hearing for about ten years, occasional tinnitus, no dizziness, no heredity. Right side, small lentil-sized thin circular cicatrix in the anterior inferior quadrant; left, rather marked thickening in the intermedial zone (perhaps likewise the result of a former middle-ear suppuration). The cicatrix is sharply defined, transparent, and moves very easily, as does also the whole *Mt* on rarefaction of the air in canal by means of the Delstanche raréfacteur.

Whisper, { right, 90 cm ("sieben" "acht"),
 { left, 1 m ("sieben" "acht").

Lower-tone limit, { right, Des_1 ,
 { left, 19½ d.v.s. (the deepest tested tone).

"A" fork upon vertex in the right — 8 seconds,

"a¹" fork upon vertex in the right — 5 seconds.

Rinné a¹, { right, + 19 seconds,
 { left, + 29 seconds.

E. G. Whistle, { right, 2.9,
 { left, 2.7.

Catheterization penetrated both sides in moderate stream; no real change.

All the examined cases are placed together in review in the following table according to the age, severity, history, and the results of the objective investigation.

TABLE.

No.	DISEASE.	SEX.	AGE.	ETIOLOGY.	Heredity.	Tinnitus.	Vertigo.	WEBER'S TEST.	Perception by B. C. ¹	RIGHT.				LEFT.			
										Whisper.	Lower-tone Limit.	Rinne Test.	Upper-tone Limit.	Whisper.	Lower-tone Limit.	Rinne Test.	Upper-tone Limit.
1	Sclerosis.	Female.	54	—	—	—	—	In poorer.	+ 17 sec.	7 m >	19.5 d. v.	+	1.1	30 cm	G ₁	+ 14 sec.	1.3
2	"	Male.	21	—	—	—	—	In both alike.	+ 13 "	6 m	F ₁	+	1.2	7 m	F ₁	+ 31 "	1.2
3	"	Female.	27	—	—	—	—	In poorer.	+ 12 "	20 "	G	+	1.1	20 m	G ₁	+ 11 "	1.1
4	"	Male.	32	—	—	—	—	In both alike.	+ 15 "	15 "	F	+	1.2	35 "	D	+ 9 "	1.1
5	"	Female.	42	—	—	—	—	"	+ 17 "	65 "	G	+	1.1	18 "	C ₁	+ 7 "	1.1
6	"	Male.	34	—	—	—	—	"	+ 10 "	7 m >	19.5 d. v.	+	1.1	40 "	C ₁	+ 10 "	1.1
7	"	Female.	22	—	—	—	—	In poorer.	+ 4 "	10 cm	F ₁	+	1.1	60 "	G ₁	+ 7 "	1.1
8	"	Female.	26	—	—	—	—	"	+ 12 "	3 "	F ₁	+	1.1	25 "	F ₁	+ 9 "	1.2
9	"	Male.	52	—	—	—	—	Useless.	+ 11 "	Only conversation.	E	+	1.1	Uncertain.	F ₁	+ 12 "	1.2
10	"	Female.	47	—	—	—	—	In poorer.	+ 7 "	8 cm	fis ¹	+	1.4	4 m	fis ¹	+ 17 "	1.1
11	"	Male.	32	—	—	—	—	Useless.	+ 9 "	5 m	16 d. v.	+	2.0	Deaf.	16 d. v.	+ 16 "	6.2
12	Nerve deafness.	"	10	—	—	—	—	In better.	+ 6 "	2 m	16 d. v.	+	1.1	18 cm	16 d. v.	+ 21 "	1.1
13	"	"	47	—	—	—	—	"	+ 9 "	40 cm	19.5 d. v.	+	1.1	60 "	19.5 d. v.	+ 28 "	1.1
14	"	"	43	—	—	—	—	In both alike.	+ 9 "	10 "	16 d. v.	+	1.1	30 cm	16 d. v.	+ 17 "	1.1
15	"	"	12	—	—	—	—	Useless.	+ 0 "	1.5 m	27 d. v.	+	1.1	12 "	27 d. v.	+ 11 "	1.1
16	"	"	54	Measles.	—	—	—	In better.	+ 0 "	35 cm	D ₁	+	1.1	2 "	G ₁	+ 11 "	1.2
17	"	"	37	—	—	—	—	In poorer.	+ 10 "	15 "	21 d. v.	+	1.2	3 "	22.5 d. v.	+ 17 "	1.2
18	"	Female.	49	Syphilis.	—	—	—	Uncertain.	+ 0 "	35 "	25 d. v.	+	3.6	2 "	22 d. v.	+ 0 "	2.9
19	"	Male.	70	Gunning.	—	—	—	In both alike.	+ 0 "	15 "	25 d. v.	+	1.2	8 "	19.5 d. v.	+ 27 "	1.1
20	"	"	36	Explosion.	—	—	—	In better.	+ 5 "	15 "	25 d. v.	+	1.1	Uncertain.	G ₁	+ 0 "	5.6
21	"	"	33	Salicyl.	—	—	—	"	+ 8 "	8 "	19.5 d. v.	+	3.7	Uncertain.	G ₁	+ 10 "	3.4
22	"	"	25	Explosion.	—	—	—	Useless.	+ 0 "	3 "	F ₁	+	6.5	"	G ₁	+ 0 "	7.4
23	"	Female.	78	—	—	—	—	Uncertain.	+ 8 "	80 "	27 d. v.	+	2.9	Deaf.	A ₁	+ 23 "	4.6
24	"	"	18	—	—	—	—	In better.	+ 0 "	1 m	C	+	1.2	4 m	16 d. v.	+ 25 "	1.2
25	"	"	34	—	—	—	—	"	+ 20 "	90 cm	F ₁	+	1.1	7 m <	16 d. v.	+ 23 "	1.1
26	Traumatic rupture.	Male.	27	Hit.	—	—	—	In poorer.	+ 8 "		D ₁	+	2.9	1 m	19 d. v.	+ 29 "	2.7
27	Nerve deafness with O. M. P. Res.	"	31	—	—	—	—	"	+ 8 "			+					

¹ In the cases of sclerosis, traumatic perforation, and Case 27, the duration of perception is here indicated only for the testing with the A tuning-fork, in the cases of nerve deafness the same only with the a¹ tuning-fork

REMARKS ON THE ABOVE CLINICAL HISTORIES.

As is manifest from the clinical histories presented above, those cases of hardness of hearing were considered, according to Bezold's proposition, as sclerosis of the sound-conducting apparatus, which, with nearly completely normal *Mt*, absence of gurgling sound on auscultation during catheterization, presented the following *triad* of functional symptoms: (1) a lesser or greater contraction of the tone scale in its lower limit per A. C.; (2) a prolongation of B. C. above the normal, at least for tones in the lower compass of this scale (Schwabach); and (3) either a marked contraction or a negative result of the Rinné test.

Circumscribed and diffused thickenings of the *Mt* were not considered, as Bezold has shown in "Schuluntersuchungen" that these changes have an imperceptible effect on the hearing.

The range of hearing for speech goes, as a rule, hand in hand with the lowering of the lower-tone limit, although exceptions also are noticed.

Rinné's test generally gave negative results in the cases of sclerosis and in only two ears (Case 2 right and Case 10 left) with relatively almost normal hearing distance for speech a more or less contracted positive result in the tested ear.

(In Case 1 right, Case 2 left, and Case 7 right, the nearly or quite normal result of Rinné's test, as also the hearing distance for the whisper, was not impaired.)

The "A" fork upon the vertex was always heard longer than in the normal. The results with other tuning-forks are reported below.

The age of the patients varied between twenty-one and fifty-four years (thirty-five years on the average). Five were men, six were women. Heredity was noticed in two cases only. Subjective sounds were observed in ten cases, vertiginous symptoms in three. All those cases of hardness of hearing were accounted as of nerve origin, which showed normal *Mt* and tubes, and the following functional conditions: (1) a contraction of the B. C.; (2) a sure perception of the deeper tones, entirely or almost, up to the normal lower-tone limit

for A. C.; and (3) an uncontracted or slightly positive result of the Rinné test.

In only two cases (19 and 21) was the Rinné test (always with the a^1 fork) in one ear found to be ± 0 ; in both of these ears the hearing distance for the whisper was so disproportionately worse than on the other side that this behavior of the Rinné test was to be expected, as evidently the B. C. of the better ear here manifested itself. In one case (Case 24) the Rinné test could not be utilized, as the patient neither heard the tone of the " a^1 " fork by A. C. nor by B. C. In the remaining cases the Rinné test was indicated as $+t$, *i. e.*, the tuning-fork " a^1 " was generally no longer heard by bone, but only by A. C.

The age of the patients with nervous deafness vary between ten and seventy-eight years (average forty-one years). Eleven were men, four were women. Heredity was noted with certainty in two cases (22 and 24). Subjective noises existed in twelve cases, and vertigo in seven cases.

Though the number of cases examined is small, it shows the same contrast between sclerosis and nerve deafness, which Bezold had found in his statistics.

Passing now on to the consideration of the results obtained by my examinations according to the method of Bezold-Hartmann, I will, for the sake of clearness, divide my description into two parts, and at first speak of the A. C.

Even a passing glance at my diagrams (see Plates I.-III.) suffices to notice a sharp difference between a case of sclerosis and a case of nerve deafness. In the first the acuteness of hearing of the patient increases within the generally accessible tone scale rather regularly with the mounting of the tone heights; in the second case the reverse is the case, at least in the majority of instances.

This result, which corroborated the experience of Hartmann and Gradenigo, could by no means be unexpected.

Even the regular absence of a portion of the lower end of the scale in sclerosis and the generally more or less complete preservation of this portion in diseases of the internal ear, while in the latter the upper end of the scale

by the Galton whistle, etc., more frequently shows defects, pointed to the possibility of such a contradictory condition in the course of the scale.

In whatever way we may undertake the investigation of the duration of perception of the different tones in the diseased ear, whether according to Hartmann's method, or in the way I undertook, according to the suggestion of Bezold, we always have to determine the threshold value for each patient.

"Just as the threshold excitation constitutes a convenient and relatively certain help in many psycho-physical and physiological investigations, in particular also for the hearing organ, we are entitled," says Bezold, "to employ it in our diagnostic tests of the diseased ear."

When we ascertain the threshold value of a tone, we determine at the same time its sharpness of perception (its audibility). That the individual portions of the scale behave very differently in the different localizations of diseases in the ear, according as they depend upon disease of the conducting or of the perceiving apparatus, has long been shown by numerous publications.

WOLLASTON¹² declared in the beginning of the nineteenth century that the hardness of hearing, which originated through increased tension of the *Mt*, manifests no uniformity for high and low tones, but only deafness for low tones.

Furthermore POLITZER¹³ says in his text-book, that he has shown upon the basis of his experimental investigations on the cadaver, that in impediments in the sound-conducting apparatus of the middle ear in general high tones are better heard than deep.

MACH and KESSEL¹⁴ found, that already with an increase of the air pressure by 14 *cm* of water, the deeper tones disappear. Experimenting with deep organ pipes; the latter author found an extinction of the fundamental tone and an accentuation of the over-tones.

LUCAE¹⁵ and others noticed the same in persons that could contract their tensor tympani at will.

BEZOLD¹⁶ observed further that by artificial retraction of

the *Mt*, which a person can bring about by a deep inspiration during firm closure of the nose and mouth, the lowest portion of the tone scale is extinguished, the duration of perception for the middle tones is shortened, and the acuteness of hearing remains unchanged only for the higher tones (c^4 and fis^4). The same results are observed with Valsalva's experiment.

Already JOHANNES MÜLLER¹⁷ has attempted to give an explanation of these phenomena. According to his opinion these phenomena are explained by the elevation of the fundamental tone to which the *Mt* is tuned.

In all these cases it is evident that the normal functional conditions of the sound-conducting apparatus are artificially changed, and it is therefore very natural to believe that analogous functional disturbances exist, also in pathological changes of the sound-conducting apparatus.

In fact the investigations of Bezold have completely confirmed the above. "The A.C. is the more impaired in disease of the sound-conducting apparatus the lower we go in scale, and if we only possess continuous sources of tone, reaching far enough down, we can ascertain the tone limit in every case, be it great or slight disturbance of this apparatus. From this limit downwards the remaining portion of the tone scale is no longer heard per A.C." Concerning sclerosis in particular, in fifty-eight cases investigated by BEZOLD¹⁸ the whole lower scale from A down remained unperceived in thirty-two cases and even in one case from A¹ down.

The same was found by Alderton, who says "that in cases of otitic media catarrhalis the duration by A.C. is impaired principally for the deeper forks."

Concerning diseases of the perceiving apparatus, BONNAFONT¹⁹ has already shown, that in nerve deafness the ability of perception for high tones decreases, while deep tones are still well perceived.

LUCAE²⁰ says, that "complete loss of the higher musical tone, to which the normal acoustic re-acts most sensitively, indicates with certainty an affection of the internal ear."

OSCAR WOLF,²¹ by means of his qualitative testing of the

hearing by speech, noticed that in labyrinth diseases the patients hear the deeper tones very well, while the Sch tones, whose height of tone varies according to his investigation between a^3 and fi^4 , were no longer perceived.

SCHWARTZE²² has described a permanent loss of perception for high tones and later total deafness in a musician, produced by a locomotive whistle.

Finally, I have already shown that Bezold considers "an unmistakable perception for the deeper tones nearly or completely up to the lower-tone limit for A. C." as the most certain symptom to exclude a chronic middle-ear affection.

It might be expected after all the above, that as by each of the two known forms of disease of the hearing apparatus a greater or lesser portion of the tone scale disappears, in one the deeper, in the other the higher tones, in the remaining portions of the tone scale a certain corresponding relation between the tones will exist.

In this connection it should be pointed out, the results obtained by Gradenigo, Hartmann, and myself, according to the method of Hartmann, are very instructive.

When we compare the cases of sclerosis with each other, the retention of that portion of the tone series for which hearing still exists corresponds as uniformly to our suppositions as one can wish. In only two cases (9, 10) have I been able to observe that the tones of the tuning fork a^2 were perceived somewhat less than the tuning-fork a^1 . This can therefore easily be an error of observation. *In all other cases every higher tone was heard better than all the remaining deeper tones.* The differences which my diagrams offer between one another are exclusively quantitative and not qualitative; these differences appear in the impairment of a greater or lesser number of the deeper tones and in a correspondingly increasing lowering of the acuteness of hearing for the remaining portions of the tone scale.

Much more varied in their form are the diagrams of **nervous hardness** of hearing. In the majority the resulting curves have an irregularly undulatory appearance. They show, as a rule, conformably to the prevailing theory, in-

creasingly worse hearing for the higher tones, but show at the same time in unmistakable fashion that it is not at all rarely the case that in the portions of the remaining tone scale one or more higher tones were heard better than the deeper. Even so in disease of the nerve apparatus can one or another tone tract in some one portion of the scale, as also in its lower end, be quite extinguished.

These facts permit of a very simple explanation. In sclerosis we have to do with the disease of an apparatus, whose individual parts stand in quite a fixed functional connection in each given case. In other words, *we have always to do with the apparatus as a whole*. The apparatus is then also as a whole, *i. e.*, in its co-ordination, altered, when in any way only one of its parts is affected, hence evidently in one case the alterations can be greater, in another slighter.

As an especially instructive example might still be added the case of traumatic rupture of the *Mt* (Case 26) in the above clinical histories. The injury happened to a previously normal ear, as we might conclude from the statement of the patient and the condition of the other ear. The trauma had limited itself to the rupture of some fibres of the *Mt* and left the nerve apparatus intact, as we can conclude by the entirely similar height of the upper-tone limit with the E. G. whistle on both sides. The obtained diagram and the other behavior correspond entirely with the functional picture obtained in sclerosis; only all alterations are less pronounced, corresponding to the slight anatomical lesion of the sound-conducting apparatus and the slight lowering of the hearing distance for speech.

Quite otherwise is the behavior of diseases of the perceiving apparatus. Each one of its parts has its specific design, and the alteration of a part does not necessarily influence the function of the remaining parts. When we consider the dissimilar causes generally leading to the development of labyrinthine affections, we must expect only exceptionally to see a disease of the entire labyrinth as a whole, and still more rarely a similar disease of all its individual parts, although this may occur. Even so is conceiva-

ble a successively uniform increasing diminution in the scale upwards or downwards; in the latter case the corresponding diagram may appear just as regular as in sclerosis, and may come to resemble it entirely, to which Hartmann's third type of hardness of hearing corresponds. As such are evidently to be understood the two observations, 20 and 22. In both cases the beginning of the development of the hardness of hearing was caused by a single strong and unexpected concussion (gun explosion). Moreover, in both cases a permanently injurious action was brought about through their profession, both were millers; in one also existed the heredity disposition. In these cases we must believe that the disease affected all parts of the labyrinth rather uniformly, only that the upper was affected successively more markedly than the lower, and hence the corresponding diagram represents such regularity. In the remaining cases the diagrams corresponded to Hartmann's 4th type of hardness of hearing, which, as said before, might well be expected *a priori* as the more frequent. In two cases the cause was an undoubted inflammation—*i. e.*, a process, in which one must assume that the individual parts were attacked in unequal degrees, as in atrophic processes, the existence of which could reasonably be admitted in the above two cases. One of these cases (18) was examined in the acme of cerebral syphilis, in the second (15) the disease originated as a sequel to measles. To these cases may apparently be added a third, in which the patient declared the affection originated through the use of large doses of salicylates. In all the remaining cases, the etiology is either unknown or at least not determinable with such certainty as in the first two cases.

Case 25 stands quite isolated, and undoubtedly is to be considered as a disease of the internal ear. Judging from its diagram, it corresponds, at least so far as concerns the A. C., with none of the types described by Hartmann as belonging to nervous deafness, but corresponds much more, at least for the A. C., entirely to the form which Hartmann and we have found in sclerosis. Nevertheless we cannot doubt that exceptionally disease of the nerve apparatus

may also produce the form which regularly exists in sclerosis. The diagnosis of a hardness of hearing in such a case is sufficiently assured through the characteristic opposite condition of the B. C. and the results of the Rinné test.

As above stated, my design was to investigate exclusively such cases as showed only one form of disease, and not a combination of diseases of the sound-conducting and perceiving apparatus. An exception was made in one case in which the clinical condition was especially clear. In this diagnostically undoubted case (27) of residues of a former affection of the conducting apparatus, as is plain from the statements of the intelligent patient (physician) and the examination of the ear, the functional examination, according to Bezold's method, showed, moreover, an unequivocal affection of the perceiving apparatus. The latter diagnosis is sufficiently proven by the contraction of the B. C., even for the tones A and a, the considerable lowering of the upper-tone limit by the E. G. whistle, and the nearly normal positive result of the Rinné test on both sides. The diagram of this case, obtained in the usual way upon the basis of the testing of the duration of A. C. of different tones, is very interesting; it shows us, namely, in the lower half of the scale the usual picture of disease of the sound-conducting apparatus, and in the upper half that of nervous deafness. We obtain here in one part the picture of the latter, just as in Cases 20 and 22 (compare diagrams), but on the other side, in the lower part of the scale, the increasing contraction of the tones up to the disappearance of the lowest portion, as it occurs in the results of middle-ear suppuration and other affections of the sound-conducting apparatus, so that in this case the culminating point of the best hearing falls in the middle of the scale.

There still remains one word to say upon the investigation of B. C. for tones of different heights, according to Hartmann's method. As already intimated above, these investigations were limited to three tuning-forks. Concerning this, I may limit my remarks to a few words, as all my results completely confirm the generally known investigations of Schwabach, Hartmann, Bezold, and others.

As is known SCHWABACH²³ was the first to find, that in impediments to sound-conduction in consequence of diseases of the middle ear, the vibrations of a tuning-fork brought in contact with the bones of the head were perceived longer than in the normal condition, whereas in diseases of the acoustic nerve the perception was shorter than normal.

The fact that in diseases of the sound-perceiving apparatus a diminution of the B. C. also for high tones takes place, has long been known.

In our above collected cases of sclerosis there was observed without exception a lengthening of the B. C., which appeared especially marked in examinations with the deeper tuning-fork A. In nearly half of the cases (five) there was observed a considerable lengthening by B. C. for all of the three forks tested. In the cases of sclerosis with considerable impairment of hearing there was a more or less marked diminution of the duration of perception also for B. C., which concerns, however, only the higher tones and increases successively according to the elevation. The fork A was always heard still longer than normal. The duration of B. C. tested with the remaining two forks was either equal to or shorter than the normal; indeed it can even entirely disappear for the a¹ fork (Case 2).

Quite the contrary was observed in the *diseases of the perceiving apparatus*. In all of the above cases of disease of the internal ear there existed a contraction of B. C., increasing with the pitch of the tone.

Alderton also arrived at the same result through his investigation.

The quantitative measurements given here of the duration of perception for a long series of tones in the whole course of the scale have yielded results which agree with the results of the functional examination of the ear up to the present. Moreover, the above investigations show that this method frequently possesses a considerable diagnostic value. Attention, in this connection, is called to the four cases of sclerosis, in which we found a distinct reduction of the lower-tone limit for one ear, while in the other ear, with apparently

little or no hardness of hearing for speech, the lower-tone limit was nearly normal. One case here must unfortunately be put aside, because the better ear was not examined according to the quantitative method (Case 7). The more important are the remaining three cases (1, 2, and 10), which show of what diagnostic significance this quantitative examination method sometimes can be. In two of these cases (1 and 2), according to the testing with speech, the sclerosis of the sound-conducting apparatus appears to be limited exclusively to one ear, while sclerosis, as is known, generally appears bilaterally (according to Bezold in 88.8 per cent. bilateral and only in 11.2 per cent. of the cases unilateral). In these two cases a completely normal state is shown for the other ear by the testing with speech. The hearing distance for speech in the third case (10) was reduced to 4 m. Only the quite inconsiderable shortening of the normal lower-tone limit (Cases 2 and 10), and the shortening of the Rinne experiment, as found in these cases, could justify us in assuming, also in the second seemingly normal ear, the inception of the same severe disease. This assumption could be confirmed by the quantitative examination extending over the whole scale. In these cases, namely, was the normal duration of perception for high tones found successively more and more contracted downwards for the deeper tones, in one case (1) only in a slight degree, relatively marked in both the others.

The only unfavorable side to the extended quantitative measurement in practice is the disproportionately long time which they require.

Alderton's remark, that in judging of the relative advantages of different methods we should, least of all, consider the time consumed, is certainly for physiological and clinical investigations completely justified, but where further methods exist, which furnish nearly equally accurate results, the question of time is, at least for the practitioner, not unjustifiable.

Such a shorter method is the one which Bezold recommends for the examination of ear patients. The testing of the lower and upper-tone limits, the duration of B. C., and

the Rinné experiment are indispensable in each case of doubtful diagnosis; the quantitative examination which extends over the whole scale, is certainly not absolutely necessary for the diagnosis, but well might be pointed out as a substantial and instructive supplement to our nosological knowledge of the picture of the disease.

Concerning diseases of the internal ear, the above described examination, extending over the whole scale, enables us not only to determine the diagnosis of disease of the cochlea in general, for which the hitherto used methods are sufficient, but also to localize upon the basis of Helmholtz's theory the disease of certain circumscribed places of the scala cochleæ.

In conclusion I wish to express my heartfelt thanks to my honored teacher, Prof. Dr. Bezold, as well for suggesting the foregoing investigations as for his friendly assistance in their execution.

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REPORT OF MEETINGS OF THE HUNGARIAN
OTOLOGICAL AND LARYNGOLOGICAL
SOCIETY.¹

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Translated by Dr. A. DUANE, New York.

NOVEMBER 15, 1894—JANUARY 25, 1895.

BÜKE : A Case of Sinus-Phlebitis.—Patient, male, gave a history of otorrhœa with repeated attacks of earache since his childhood. For fourteen days continuous violent headache, and for eight days vertigo so intense that he could scarcely walk.

When received into hospital, patient much prostrated, answers questions slowly, complains constantly of pain. Mastoid intact and not sensitive to pressure. Great tenderness behind the mastoid and all along the sterno-cleido-mastoid down to the clavicle; the jugular plainly felt by palpation, appearing as thick as the little finger. Walls of external meatus normal; latter contains fetid pus mixed with epithelial shreds; membrana tympani replaced by fleshy granulations. Hearing for watch and voice, 0. With Weber's test, patient's answers unintelligible. In the evening patient had a chill; temperature, 38° C. Iced applications gave no relief.

No operation was performed, the patient's condition being regarded as hopeless on account of the continuous fever (amounting to 40° C.), repeated chills, and the stupor. Jaundice set in on the fourth day, followed by diarrhœa with yellowish and sometimes bloody stools. Seventeen days after admission the patient died, after repeated attacks of convulsions.

¹ Report abridged, and laryngological part omitted.

Autopsy showed an abscess as large as a walnut on the under surface of the cerebellum. In its vicinity, the white substance was softened and broken down, and the pia was covered with a fibrinous exudate. Tegmen tympani intact. The inner wall of the sigmoid fossa was porous and showed a perforation 2 *cm* in diameter close to the jugular foramen, and the sigmoid sinus was blocked up partly with an organized thrombus, partly with broken down, brownish debris adherent to the sinus-wall. The same changes visible in the internal jugular vein. Metastatic abscesses in the peripheral parts of the lungs, necrosis of the pleura, fibrinous and purulent exudation in both pleural cavities, parenchymatous degeneration of the liver and kidneys.

BÖKE : Removal of a Foreign Body in the Tympanic Cavity by Operation.—A girl, three and a half years old, had put a grain of maize in her right ear ; fourteen days before she was seen, unsuccessful attempts at removal ; since then pain and discharge. On examination, there were found excoriations of the auricle and canal. The foreign body was seen imbedded in a perforation in the posterior-inferior quadrant of the drum-membrane ; the latter elsewhere was red and swollen. Ear ordered to be syringed out every two days.

Thirteen days after she was first seen she was put in the hospital, and another unsuccessful attempt was made to remove the foreign body. The temperature then rose slightly (38.8° C.). Syringing with boric acid ordered three days later, anæsthetic given, auricle dissected up, and posterior cartilaginous wall of the meatus divided. Foreign body, which was found to lie wholly in the drum cavity, was here readily removed, and the wound was sewed up and dressed. For two days no serious reaction. On the third day beginning pain in the neck, and twelve days after operation evident signs of meningitis, which, in three days later, ended fatally with coma and convulsions.

Autopsy showed fibrino-purulent leptomeningitis of base of brain and of the cord, with consecutive acute internal hydrocephalus. Acute catarrh of the middle ear. Purulent otitis externa with consecutive hyperæmia and œdema of the interior of the mastoid. Operation wound partially healed. Catarrhal bronchitis of the lower lobe of both lungs.

BÖKE : Facial Paralysis in the Course of an Acute Middle-Ear Catarrh.—The patient, aged twenty-five, had, immediately after exposure to the weather, developed earache and

deafness, and on the following day facial paralysis of the same side developed (affecting the tongue, but leaving the uvula exempt). Seen on the following day, when he showed injection of the drum-membrane, particularly along the handle of the malleus, with sunken drumhead and absence of the cone of light. Air introduced into the tympanum by catheterization produced a crackling sound, but no essential elevation of the depressed membrane. Watch heard only on contact; on Weber's test, fork lateralized in affected ear. By the use of cold applications and politizerization, both the catarrh of the tympanum and the facial paralysis disappeared.

This sort of facial paralysis is usually called "rheumatic," the deafness being overlooked on account of the good hearing in the unaffected ear. It may originate either from a dehiscence of the bony wall of the Fallopiian canal, allowing the swollen mucous membrane of the middle ear to press directly upon the nerve; or from pressure upon the latter by the stylo-mastoid artery which runs in the Fallopiian canal and which shares in the general distention of the tympanic vessels. The spot where the nerve was compressed, in the present case, must, since the uvula was intact, have been beneath the genu facialis, for the fibres running to the uvula arise from the geniculate ganglion.

FEBRUARY 29, 1895.

POLYÁK : Tuberculoma of the Nose (Demonstration).—The patient, a woman, forty-nine years of age, had for six months had epistaxis from right naris and gradual occlusion of latter; for six weeks formation of crusts in left naris, and epistaxis from latter also. A flat, slightly elevated whitish mass, bleeding readily, and covered with crusts and here and there with granulations, was found on the septum in each naris. From the mass in the right naris projected an irregular nodular tumor, looking like granulation tissue, and entirely filling the cavity of the nose on that side. This tumor was removed with the galvano-cautery snare. It was 30 mm long and 14 mm broad; was red externally, grayish on section. The mucous membrane covering it was partially deficient; where present it was thickened, indeed almost like cuticle. The tumor consisted of a network of connective tissue, poorly supplied with vessels, and containing in its meshes numerous tubercles containing a few characteristic giant-cells and surrounded by infiltrates of round cells. Bacilli very few; mostly in the giant-cells.

The cartilage at the portion of septum affected had disappeared. No tuberculosis of the lungs or other organs, and no signs of cachexia.

Tuberculosis of the nose occurs usually under the form of granulating ulcers, which show a great tendency to break down. Its occurrence under the form of a tumor, as in the present instance, is very rare. It shows a great tendency to recur, but only rarely leads to general tuberculosis.

KREPUSKA : Primary Carcinoma of the External Auditory Meatus (Demonstration).—The patient, a woman, sixty-two years of age, had suffered for years from eczema of both external auditory canals. Treatment caused complete cure in the right and considerable improvement in the left. Four months later granulations discharging pus and blood formed on the cartilaginous portion of the left canal. This turned out to be an epithelial cancer, which spread to the membranous portion of the canal and, after perforating the bony canal, to the retro-maxillary region. Later also œdema of the auricle and mastoid developed. The operation, although regarded as entirely hopeless, was undertaken at the urgent instance of the patient herself. The tumor was then found to fill the whole tympanum and to extend into the sphenomaxillary fossa and the back of the throat. Death eight months after the operation.

From the histological examination it was apparent that the starting-point of the tumor was the excretory ducts and the acini of the ceruminous glands. The malleus, while retaining its original form, was converted into a peculiar non-osseous mass of connective tissue, filled with cancer-pearls. The incus, on the other hand, was only partly cancerous.

The author regards the eczema as being at least an accessory cause of the development of the carcinoma.

MAY 24, 1895.

LICHTENBERGER : Case of Neuralgia of the Mastoid Cured by Operation.—A girl, sixteen years old, was said to have suffered from childhood from a variety of aural affections. For three months constant excruciating pain over entire left mastoid region. Marked bilateral deafness. Except for evidences of an otitis media catarrhalis sicca, no lesion objectively perceptible in either ear or mastoid.

The mastoid was opened, and, except for the pallor of the mucous membrane lining the cells, was found to be perfectly

normal. Cells numerous and extending through the whole bone. Complete extirpation of the mastoid performed. No reaction ; complete disappearance of, pain ; marked improvement of hearing. The latter may be regarded either as the direct result of the operation or as due to the fact that the sensitiveness of the auditory nerve, which had been depressed by the constant pain, had been restored upon the cessation of the latter. Three months later the patient developed similar severe pain on the right side, for which also an operation had to be performed. Left side up to time of last note remained entirely free from pain.

In the discussion, KREPUSKA reported the case of a woman, sixty-three years of age, upon whom he had performed paracentesis for an exudative catarrh of the middle ear consecutive to influenza. The otitis was cured in ten days and the fever disappeared, but violent pain radiating over the whole side of the head set in, and persisted, in spite of treatment, until a week after, when the mastoid was opened. The latter was found to be totally sclerosed and eburnated. No pus or other morbid material found. The pain ceased at once, and the hearing improved. Primary union.

NÉMAI : Empyema of the Sphenoidal Sinus and Ethmoid Cells.—History of occlusion of nares of ten years' duration, with purulent discharge and hemicrania. Polypi in right middle meatus. Creamy pus between middle turbinate and septum. Necrosed bone could be felt when a sound was introduced into the sphenoidal sinus, and small quantities of pus could be evacuated from the latter by syringing.

JUNE 11, 1895.

TOMKA : Objectively Perceptible Noises in the Ear.—A boy, six years of age, was under treatment for deafness, resulting from a chronic otorrhœa which had run its course. Hearing for whisper improved by repeated politzerization in from three-fourth metre at the beginning of the treatment to five metres at the time of last record.

In postero-inferior part of right drum-membrane a dry perforation, through which can be seen the promontory, covered with normal mucous membrane, and the fenestra rotunda. Eustachian tubes freely pervious. Left, hearing normal. In Weber's test, sound of fork lateralized in the poorer (right) ear. Rinné, right negative ; left uncertain. Throat swollen and granular.

For two weeks noises emanating from ear and audible at a

distance of one metre. Occur at irregular intervals ; produced involuntarily and increased by movement of the patient and by talking ; unaffected by swallowing, chewing, and pressure on the carotid or soft palate. Patient has the bad habit of drawing the nasal mucus back into his throat and spitting it out ; and when this habit was corrected the noises diminished.

Noises probably due to contraction of the tensor palati.

TOMKA : An Instrument for Operating upon Cases of Chronic Suppuration of Shrapnell's Membrane.—This is a trephine for removing a portion of the margo tympanicus in order to make the attic more accessible to treatment in cases of fœtid suppuration from this locality. The pin of the trephine is entered and carried in until the teeth of the trephine are engaged, then the pin is removed and the trephine cautiously advanced by rotation. If more room is required, the trephine may be introduced twice, so as to make two openings side by side. Care must be used in applying the instrument, as otherwise the malleus and incus may be luxated.

LICHTENBERG : Contribution to the Question of the Operative Treatment of Chronic Tympanic Suppuration. Successful Radical Operation.—The patient, a man of forty, had seven years before an otorrhœa with mastoid swelling. After incision of the latter the symptoms had almost completely subsided. Eighteen months before Lichtenberg saw the patient, the otorrhœa recurred, the discharge showing periodical fluctuations, its decrease being associated with vertigo, headache, and sense of pressure.

Examination showed a perforation in the postero-superior quadrant of the membrane, extending backwards ; a fluctuating swelling extending down the posterior wall of the canal, and a pin-hole fistula in the mastoid. Both swelling and fistula were caused by pus from the antrum burrowing between the mastoid and the posterior wall of the canal. The latter, which was carious, and the exterior wall of the attic were removed, and the tympanum, external canal, and mastoid were thrown into one cavity. Everything carious was removed. The operation was done in the clinic, and the patient allowed to go home in four hours. Iodoform gauze was used for the first, and plain sterile gauze for the subsequent dressings. A cure was effected in six weeks. Disappearance of headache, and considerable improvement in the hearing.

OCTOBER 17, 1895.

ZWILLINGER : A Foreign Body Remaining in Nose for Eight Months. Fœtid Discharge. Asthma.—The foreign body was a tampon introduced with a Bellocq's canula. It was removed by catching up with a snare the threads attached to the tampon.

LICHTENBERG : Acute Otitis Media. Subdural Abscess. Cure.—Two cases of mastoid empyema occurring in acute otitis. In one there was a collection of pus between the dura and bone. Both were cured by operation.

STIPANITZ : Removal of the Inferior Turbinal.—Stipanitz recommends removal of the inferior turbinal either with the chisel or sometimes with the bone-forceps and scissors. A weak sublimate solution is sprayed through the nose before the operation, and a 10 per-cent. solution of cocaine is used as an anæsthetic. Hemorrhage, which is seldom great, is controlled by the application of alumnol. After the operation the nose is plugged with iodoform gauze, and the tampon is changed two or three times a day. A cure results in eight or ten days.

POLYÁK in discussing the paper thought that the operation could seldom be required, a cold snare being usually sufficient when it was simply a question of removing a portion of the turbinal which was in the way of parts to which access was desired, and the galvano-cautery being more efficient when the object of the operation is to reduce an hypertrophy.

SZENES : Caries of the Mastoid Due to Influenza. Cure by Operation.

REPORT OF THE TRANSACTIONS OF THE SECTION OF OTOTOLOGY OF THE 66TH CONGRESS OF THE GERMAN NATURALISTS AND PHYSICIANS, VIENNA, SEPTEMBER 24-30, 1894.

REPORTED BY DR. ALBERT BING,¹ VIENNA.

Translated and abridged by AD. O. PFINGST, M.D., New York.

In opening the congress Professor Politzer made a short address of welcome in which he referred to the progress made by the Society since its organization in Vienna thirty-eight years ago. He spoke of the organization of the section of Otology in 1868, and of the high standing of Otology among the leading specialties of to-day.

Among the papers read the following were of particular interest :

Dr. ROHRER : On Hysterical Deafness and Torpor of the Auditory Nerve.—Paralysis of the auditory nerve of hysterical origin is relatively infrequent. It is characterized by marked fluctuation in the function of the ear and rapid changes of the accompanying symptoms.

The symptoms may be part of a general hemianæsthesia or may appear independently. They may be unilateral or bilateral, with a variation of the hearing from very slight to profound deafness.

Dizziness is never present. Tinnitus aurium may occur. The middle ear usually remains unchanged.

In another class of cases, while there is no general hemianæsthesia there is always a concomitant lesion of the middle and sometimes the internal ear. This form, which shows a great vari-

¹ Regular society reports now being a part of the program of these ARCHIVES we supply an abstract of the above very successful meeting.

ation in its symptoms, has a transitory character. It also may occur on one or both sides.

SZENES, Budapest : **On the Therapeutic Value of Carbolic Acid and Glycerine and of Menthol in Diseases of the Ear.**

Professor GRADENIGO, Turin : **Sclerosis of the Middle Ear Occurring in Latent Inherited Syphilis.**—This affection of the ear may be looked upon as a variety of those diseases of the ear typical of hereditary syphilis in its latent stage, as described by Hutchinson and Hinton. It has the same clinical feature as chronic middle-ear catarrh with involvement of the labyrinth. Good results may be expected from constitutional treatment if it is begun early.

Dr. SCHUBERT, Nüremberg : **Brain Abscess.**—Dr. Schubert reported a case of brain abscess occurring after acute otitis media which had terminated in resolution. The symptoms began with a paresis of the 6th nerve, followed by crossed monoplegia and hyperæsthesia and later by sopor, with slowing of the pulse and Cheyne-Stokes respiration.

The operation performed at the seat of election for these cases disclosed a small abscess of the temporal lobe. A slight abatement of the symptoms followed the operation, but the case took a fatal issue five weeks later.

The autopsy revealed the presence of another abscess, of larger dimensions than the first, in the temporal lobe.

Dr. GOMPERZ, Vienna, presented a boy whose drum-membrane typified the conditions produced by the encroachment of the bulb of the jugular vein on the tympanic cavity. Gomperz stated that of the five reported cases, in which the vein had been punctured during paracentesis of the drum, one had terminated fatally, and suggests that the paracentesis be made in the antero-inferior segment of the drum in these cases.

Professor GRUBER spoke of a case occurring in his clinic. The drum-membrane had not appeared blue in that case, an explanation for which might be found by a deeper situation of the vein.

Dr. BRIEGER had observed a case in which the bulb of the vein did not extend as far forward at the anterior segment of the drum as in the demonstrated case.

Professor ZAUFAL suggested that in cases where the vein is wounded small tampons should be passed through the wound in the drum membrane into the drum cavity.

Professor POLITZER had seen hemorrhage result from wounding of the vein which accompanies Jacobson's nerve.

Professor HABERMAN had observed a case where the jugular vein projected through a spontaneous opening in the floor of the tympanic cavity as high as the horizontal semicircular canal. The latter also presented a small aperture.

Dr. BRIEGER, Breslau : **On Otitic Brain Abscesses.**—Brieger spoke of the symptoms peculiar to abscesses emanating from a diseased ear. He laid special stress upon the importance of the ophthalmoscopic changes.

Brieger also advocated the examination of the urine for peptone, as an aid to the diagnosis of intra-cranial suppuration. He recommended puncture of the sub-arachnoid space to differentiate between abscess and meningitis. He also briefly reported a case where an abscess of the brain had opened spontaneously through a fistulous passage in the upper wall of the ear canal. The patient died later from sinus-thrombosis.

Professor URBANTSCHITSCH cited a case of caries of the temporal bone in which the notable symptoms were agraphia and the inability of the patient to make himself understood. His speech was entirely unintelligible. Later there were spastic contractions of the extremities of the right side. His symptoms, which were all of a transitory nature, appeared alternately. At the autopsy it was seen that meningitis had existed, there being no sign of a cerebral abscess. The symptoms had no doubt been caused by a transitory œdema.

Urbantschitsch once saw a case which the subsequent autopsy showed to be œdema, in which deafness and blindness were the alternating symptoms.

Professor GRUBER related a case of brain abscess seen in his practice in which blindness and deafness were present, which opened spontaneously into the external auditory canal. The pus had the peculiar foul odor characteristic of brain abscess.

Dr. REINHARD, Duisburg, demonstrated upon the head of a cadaver the mode of entering the mastoid cells, of removing the posterior and part of the upper wall of the ear canal, and showed how, by making two horizontal sections through the membranous ear-canal, the placing of flaps over the cavity could be facilitated.

Professor KIRCHNER, Würzburg : **On the Occurrence of a Thrombus of the Cavernous Sinus in Acute Suppuration of the Middle Ear.**—Kirchner calls attention to the suddenness with which thrombosis of the cavernous sinus may appear, in

acute suppuration of the middle ear, without any preliminary symptoms to indicate retained pus. These cases, which usually occur as a sequel to influenza, call for an early paracentesis in order to avoid the entrance of retained pus into the lymph or blood.

Dr. BING, Vienna: **Experiments on Irrigation of the Tympanic Cavity.**—Perforations of different sizes having been made in the drum membrane of a number of cadavers, a colored solution was injected into the Eustachian tubes through a catheter. By the immediate removal of the tegmen tympani and the roof of the mastoid cells, it was observed that the solution had, in those cases with a small perforation in the drum, penetrated mastoid cells and antrum, where the drum had a large opening, the fluid flowed off freely without entering the attic or the antrum.

It follows from this that, while a large opening is necessary to allow free flow of the solution, the desired effect of thorough irrigation is not attained under such conditions.

Dr. GOMPERZ, who formerly irrigated the middle ear, does no longer approve of it. He observed a case in which the irrigation was followed by unconsciousness, collapse, and, a few hours later, by death.

Professor POLITZER, who has sometimes found a cession of pain following the irrigation, would not like to part with it as a therapeutic measure.

Dr. GOMPERZ, Vienna: (a) **On the Results of Conservative Treatment of Chronic Suppuration in the Attic.**—Out of twenty cases, nineteen were cured, with an average duration of twenty days. The reaction stopped, granulations ceased to form, the mucous membrane became pale, and the hearing improved.

Gomperz resorted to the removal of the ossicles only after the conservative treatment had failed. This consisted in applying a 15-20 solution of nitrate of silver or a solution of perchloride of iron to the granulations, irrigation of the parts through a canula, and dusting with boric acid.

(b) **On the Efficacy of Artificial Drums.**—Dr Gomperz has made the observation that in those cases of perforation of the drum where there was considerable space between the perforation and the foramen ovale, where, in other words, a niche behind the handle of the malleus exposed a deep cavity, the artificial drum

did not always improve the hearing. Cotton discs were more effective, while the membrane formed by boric acid, recommended by Kosengarten, acted best.

Professor POLITZER closed the successful congress with a few appropriate remarks, in which he thanked the members present for the interest displayed during the meetings.

REPORT ON THE PROGRESS OF OTOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1895.

By Dr. A. HARTMANN, BERLIN.

Translated by Dr. A. DUANE, New York.

A.—ANATOMY.

a.—EAR.

272. ZUCKERKANDL. A point bearing upon the anatomy of the temporal bone. *Monatsschr. f. Ohrenh.*, No. 9, 1895.

273. GRUBER, J. Upon an abnormal cavity in the petrous portion of the temporal bone. *Ib.*, No. 12, 1895.

274. STEINBRÜGGE, H., and NIESER, O. Drawings of the vestibule in man. An atlas containing 25 photographs made from serial microscopic sections. Vienna, 1895.

275. POPOFF, N. M. Upon the course of the bundle of nerve-fibres known as the conductor sonorus. *Deutsche Zeitschr. f. Nervenh.*, vii., 1895.

272. ZUCKERKANDL describes the temporal bone of a boy of fourteen, in which various peculiar conditions had been produced by abnormal ossification.

A. DUPUIS.

273. GRUBER found in the petrous portion of the temporal bone a pneumatic cavity separated by thin bony walls from the tympanic cavity, the sulcus jugularis, and the internal auditory meatus, and communicating with the mastoid cells by several small apertures. In size it was $2 \times 1.5 \times 1.5$ cm. The dangers to which suppuration developing in such a cavity might give rise are obvious.

KILLIAN.

275. It appears from POPOFF's observations that the nuclei of

the fasciculi teretes are, even in the region of the hypoglossal nuclei, sharply defined by means of thin fibres, some of which are transverse, some oblique, and some longitudinal. In places the bundles can be seen to arise from the dorsal decussation of the rhaphe. The fibres of the conductor sonorus are probably of the same origin as the fibres which are connected with the auditory fasciculi. They gradually get farther and farther from the rhaphe, and at the lateral angles of the fourth ventricle they join with the middle peduncles and pass with the latter to the cerebellum.

DUPUIS.

b.—NASO-PHARYNX.

- 276. ANTON, W. Contributions to our knowledge of Jacobson's organ in adults. *Zeitschr. f. Heilk.*, xvi., p. 355.
- 277. BROOM, R. On the organ of Jacobson in the Monotremata. *Four. of Anat. and Physiol.*, xxx., pp. 70-80.
- 278. SMITH, G. E. Jacobson's organ and the olfactory bulb in Ornithorrhynchus. *Anat. Anzeig.*, xi., pp. 161-166.

B.—PHYSIOLOGY.

EAR.

- 279. EWALD, J. R. Upon the physiology of the labyrinth. Part iv. Relation of the cerebrum to the tonal labyrinth. From experiments by Ida H. Hyde. *Pflüger's Archiv*, lx., p. 492.
- 280. BERNSTEIN, J. Upon the hearing supposed to exist in doves deprived of the labyrinth. *Ib.*, lxi., p. 113.
- 281. WUNDT, W. Upon the question of the ability of doves to hear when deprived of the labyrinth. *Ib.*, lxi., p. 339.
- 282. KREIDL, A. Upon the perception of sound waves in fishes. *Ib.*, lxi., p. 460.
- 283. SCHÄFER, K. Arguments against Wundt's theory of the interference of auditory stimuli in the nerve-centres. *Ib.*, lxi., 544.
- 284. STERN, K. W. The literature in regard to the non-auditory function of the internal ear. *Arch. f. Ohrenh.*, xxxix., p. 248.
- 279. The rotation-movements of the head produced in doves by the removal of the labyrinth are after a while lessened by the development of compensatory phenomena. EWALD states that if

the cerebrum is removed before the labyrinth is operated upon, these compensatory phenomena are less apparent, and the labyrinthine symptoms themselves are increased. It would hence seem that, the greater the development of the cerebral centres, the more pronounced the compensatory symptoms would be. In consonance with this view it is found that, while in the frog these compensatory symptoms are almost *nil*, in man they are very marked—so much so indeed as to conceal in large part the symptoms due to destruction of the labyrinth.

ASHER.

280. BERNSTEIN finds that doves which have been deprived of the labyrinth show no auditory reaction to the report of a pistol or to loud sounds conveyed to the ear through a speaking-tube. They do, however, react to the sound of a whistle held five or six inches from them. As doves in which the auditory canals and tympana have been filled with plaster of Paris react in precisely the same way, the author concludes that doves deprived of the labyrinth do not really hear, and the apparent auditory reaction in the case of the whistle is due to the vibrations which the latter sets up in the body of the animal.

ASHER.

281. WUNDT believes in opposition to Bernstein (280) that doves deprived of the labyrinth are still able to hear.

ASHER.

282. KREIDEL believes that in goldfish the presence of a true auditory organ has not been demonstrated, but that they have a specially developed cutaneous sensibility which enables them to take cognizance of the sound waves.

ASHER.

283. SCHÄFER opposes the idea that binaural auditory impressions are fused in the nerve-centres. His view is based partly upon his own ingenious experiments already published, partly upon additional considerations which he now adduces.

ASHER.

284. STERN's paper is a valuable, although not perfectly complete, summary of the various articles that have been published in regard to the different functions, mechanical, static, acoustic, etc., that have been ascribed to the semicircular canals. The work is the more important, since it is becoming daily more and more evident how necessary an acquaintance with this department of otology is, as well from a diagnostic and clinical as from a physiological point of view.

E. BLOCH.

C.—PATHOLOGY AND THERAPEUTICS.

INSTRUMENTS AND METHODS OF TREATMENT.

285. SHASTID, THOS. H. A new myringotome. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.
286. SHARPLEIGH, J. B. A tympanic syringe. *Trans. Am. Otol. Soc.*, 1895.
287. THORNER, MAX. A new mastoid retractor. *Annals of Ophth. and Otol.*, Oct., 1895.
288. JONES, H. L. The electrical treatment of tinnitus aurium. *ARCH. OF OTOL.*, xxiv., 324.
289. FREUDENTHAL, W. Electro-vibratory massage of the ear, nose, and throat. *N. Y. Med. Journ.*, Sept. 28, 1895.
290. GOMEZ, V. Tinnitus aurium and results obtained by its treatment with coniine hydrobromate. *Annals of Ophth. and Otol.*, Oct., 1895.
291. KOLL, T. The employment of nosophene in rhinological and otological practice. *Berl. klin. Wochenschr.*, No. 29, 1895.
285. The operative extremity of SHASTID's instrument consists of three triangular blades set upon a shaft at equal intervals and terminating in a common point. Each blade cuts on the principle of a Beer's cataract knife. BACON.
286. The instrument devised by SHARPLEIGH is a small "wash bottle" and designed to be used with a condensed air reservoir. The bottle is of the ordinary Davidson pattern but the tubes are so arranged that the air passes directly into the bottle above the liquid, thus forcing it by positive pressure through the needle. The needles are the usual intra-tympanic ones, one straight and one curved at the tip. The stream is constant and its force may be controlled by means of the "cut-off" more or less. BACON.
287. THORNER's instrument consists of a flat S-shaped piece of steel or German silver about $1\frac{3}{4}$ inches long and $\frac{3}{4}$ inch broad. One of the extremities is shaped into a three- or four-pronged hook, while the other extremity forms a blunt retractor bent in the opposite direction. Two hooks are used to keep the wound open and they are held in position by a strip of gauze passed around the head. BACON.
288. JONES says that out of a very large number of patients

who have been under his treatment for noises in the ears, about one third have been freed by a course of treatment applied in a way which he describes. He considers it possible to determine at the first sitting whether the patient is likely to be relieved.

BACON.

289. The instrument has in its essential parts already been described by FREUDENTHAL in the *Medical Record* of July 22, 1893. He considers that there are three conditions without which no internal massage can be successful. The vibrations must be extremely rapid, they must come at regular intervals, and must be of the same intensity. He believes that all these difficulties are overcome by using his electric vibrator.

BACON.

290. GOMEZ uses coniine hydrobromate in doses of $\frac{1}{60}$ to $\frac{1}{30}$ gr. or in doses of from $\mathfrak{M} \frac{1}{10}$ to $\mathfrak{M} \text{ij}$. Its action seems to be upon the motor nerves which it paralyzes. Coniine properly exerts no direct influence upon the cerebral centres, but it is a spinal depressant.

BACON.

291. Nosophene is an iodine preparation of yellowish-white color insoluble in water, sparingly soluble in alcohol readily soluble in aqueous solutions of the alkalies. Its action depends upon the formation of its sodium salt when nosophene comes into contact with the smallest quantity of free alkali, such as *e. g.*, always occurs in the secretion of wounds. The sodium salt is anti-bacterial in solutions of 0.1-1.0 per cent. The agent is entirely free from poisonous properties.

KOLL used it in a powder-blower in cutting operations and after cauterizations in the nasal cavity; 10 per cent. nosophene gauze was tolerated in the nose for several days without causing irritation. He also used it after the operation for adenoids. Excessive nasal secretion, whether mucous or purulent, is checked more rapidly by it than by any others ordinarily used.

In otorrhœa Koll finds nosophene to be the first agent that he has tried which serves as a satisfactory substitute for boric acid. Sometimes when boric acid has been used for a long time and has not produced complete arrest of the secretion, the latter has been checked when nosophene was used in its place. Nosophene is applicable both in acute and chronic cases, a small quantity of the powder being insufflated. It does not form crusts with the secretion.

HARTMANN.

MISCELLANEOUS.

292. BARR, THOS. Giddiness and staggering in ear disease. *Br. Med. Journ.*, Dec. 28, 1895.

293. SCHEIBE, A. Some tumors of the ear. *ARCH. OF OTOL.*, xxiv., 3 and 4.

294. SNOW, SARGENT F. Aural, nasal, and laryngeal tuberculosis with special reference to the Adirondacks as a winter health resort. *Buff. Med. Journ.*, Dec., 1895.

295. KOSSEL, H. Investigations upon diphtheria and pseudo-diphtheria. *Charité-Annalen*, x.

296. KOCH, P. Upon the effect of diving upon the ear. Jubilee Volume, prepared for the centennial of the Friedrich-Wilhelm Institute. Berlin, 1895.

297. BLAKE, C. J. The relation of an aural service to the needs of a general hospital for children. *The Children's Hospital Med. and Surg. Report.*, 1869-1894, Boston, 1895.

292. After dealing with the history of the subject, BARR describes aural giddiness as manifesting itself in four distinct forms:

1. True Ménière's disease.
2. Due to pressure upon the walls of the middle ear.
3. Due to pressure upon the walls of the external meatus or outer surface of the membrane.
4. Due to irritation of the auditory nerve.

He then considers the symptoms, causes, and diagnosis of true Ménière's disease, and cites four interesting cases. The paper is an extremely instructive one.

CHEATLE.

293. SCHEIBE reports a case of fibroma at the entrance of the ear canal in a man aged fifty-six, who had noticed a tumor growing in his left ear for six years. The tumor was removed with the galvano-cautery. Seven years later there had been no relapse. Other cases reported were one of pedunculated osteo-sarcoma of the ear canal, and three cases of hairy granulation tumor in the middle ear. Histological examinations are given in full of all the tumors which were removed.

BACON.

294. SNOW describes the usual symptoms of tubercular infection of the ear and larynx, and reports several cases of tubercular laryngeal disease, where the patients received much benefit from a stay in the Adirondacks. His conclusions are as follows:

First. That a thorough rubbing in of lactic acid, in the proper strength and at regular intervals, works nicely in allaying local tubercular ulcerations.

Second. That a continuous residence, or as near so as possible, with systematic bathing and exercise, in an altitude of from 1000 to 2000 feet, together with a porous soil and adjacent forests, will greatly benefit and perhaps cure even quite advanced tubercular manifestations.

Third. That we have here at home, in the Adirondacks of our own State, localities where many tubercular patients may find the climatic and physical environment required. In fact, his personal opinion is that they will receive more benefit there than from residence in Florida, and fully as much as could be obtained in Colorado or Southern California.

Fourth. That the patients do equally as well in fall and winter, and gain more in weight than in summer months, hence we need not keep them at home for "spring to open," but should insist upon an immediate removal, when practicable, from unfavorable climatic influences.

BACON.

295. KOSSEL, like many previous investigators, concludes from his bacteriological experiments that there is no foundation for the idea that the true Bretonneau diphtheria can exist without diphtheria bacilli. The latter were absent in only 22 (8 per cent.) of the children brought in with the diagnosis of diphtheria; and of these 22 not one died. He was able to make cultivations of the bacilli from the discharge from the ear in two cases of otitis following diphtheria, and also in a case of scarlatinal otitis in which, although pharyngeal diphtheria existed, no bacilli could be found in the throat.

HARTMANN.

296. KOCH made a series of experiments upon divers of the German sea-service. They are required to be free from aural disease at the outset, and receive a graded course of instruction in their art. Koch found the effects of diving upon the ear to be somewhat different from those produced by the action of compressed air (in caissons and the pneumatic cabinet). These effects comprise :

(A) *Subjective sensations.* Of these the most marked are (1) *pressure sensations on descending.* These usually begin at a depth of 2 metres, are always present at a depth of 4 metres, and often are of such intensity as to constitute a stabbing pain. Practice diminishes them. They are due to a pressing-in of the drum membrane, are relieved by the act of swallowing, and also cease as soon as the diver touches the bottom. (2) *Sensations in ascending* are less marked, indeed usually absent. This is proba-

bly due to the fact that the construction of the Eustachian tube facilitates the escape of air from the middle ear. (3) *Sensations after emerging* comprise a feeling of dulness and deafness in one or both ears.

(B) *Objective changes* include (1) *mechanical changes*, the chief of which are depression of the membrane with prominence of the ossicles. Exceptionally, Shrapnell's membrane is found to be bulging. (2) *Vasomotor changes* comprise hyperæmia (which may persist for weeks), transudation into the middle ear, and epistaxis. (3) *Disturbances of hearing* occur directly after the immersion, but are not permanent.

(C) *Pathological changes* are very rare. They include (1) *rupture of the drum membrane*, one case; (2) *otitis media*, one case (caused by the propulsion of mucus from the Eustachian tube into the middle ear); (3) *hæmorrhage* into the labyrinth or acoustic centres. No case of this lesion is known to have occurred.

The author concludes that (1) persons with organic closure of the tube, or with either large cicatrices or marked atrophy of the drum-membrane should be excluded from this form of service. (2) That diving should be intermitted, in case of acute swelling of the tube or of coryza or pharyngitis, where there is danger of infectious matter being driven from the throat into the ear. (3) Practice must be suspended if tinnitus, not disappearing in a short time, recurs after each immersion. (4) Swallowing is the remedy for pain in the ear produced by diving. (5) Stopping the ears is perfectly useless. [The Reviewer's experiments with the pneumatic cabinet show that the effects of over-pressure are most readily relieved, the slighter the latter is, and that when the latter is marked, it is difficult to open the tubes. It would seem therefore advisable to direct divers to make a swallowing movement as soon as they begin to go down.] HARTMANN.

297. For the five years ending in 1893, there were forty-two ear cases treated at this hospital. This number does not, however, include the cases in which the ear trouble was secondary to, or a complication of, some other disease for which the patient was admitted. BLAKE says that "the importance of having an aural surgeon as one of the consulting staff of such an institution as the Children's Hospital has been sufficiently demonstrated during the last five years, and is evident on consideration of the frequency with which the ear is implicated in the course of the

contagious diseases of childhood, the rapidity with which such implications run a destructive course in many cases, and, consequently, the importance of prompt attention." The writer believes that much of the treatment in both the acute and chronic diseases of the ear may advisedly be left to an intelligent nurse, properly instructed, and the wards of the hospital afford an excellent opportunity for teaching. It is proposed to offer, in the Aural Department of the Massachusetts Charitable Eye and Ear Infirmary, a short special course on the examination and diagnosis for the house officers of the Children's Hospital, as preliminary to their entering upon their hospital duties.

BACON.

EXTERNAL EAR.

298. SZENES, S. Upon a rare case of external otitis of infectious origin. *Ann. des mal. de l'oreille, etc.*, No. 8, 1895.

299. HUTCHINSON, J. On erosive inflammation of the external ear. *Arch. of Surg.*, Oct., 1895.

300. RICHARDSON, C. W. A case of living larvæ in normal auditory canals. *ARCH. OF OTOL.*, xxiv., 304.

301. ADAMS, A. E. A foreign body in the auditory canal. *Trans. Am. Otol. Soc.*, 1895.

302. MOURE, E. J. Cavernous angioma of the ear. *Rev. de laryngol.*, No. 23, 1895.

303. COURTADE, A. Case of occlusion of the auditory canal; operation. *Ann. des mal. de l'oreille, etc.*, No. 12, 1895.

304. CORRADI, C. Perforation of the drum-membrane from indirect causes, considered particularly from a medico-legal standpoint. *Arch. f. Ohrenh.*, xxxix., p. 287.

305. MATTHEWSON, A. Subsequent history of a case of aural exostosis, first operated on in 1876. *Trans. Am. Otol. Soc.*, 1895.

306. GREEN, J. ORNE. Cartilaginous exostoses of the ear, *Ib.*, 1895.

299. HUTCHINSON believes that most of the erosions of the external ear are of the nature of frost-bites, although some are lupous in character. He reports three interesting cases.

CHEATLE.

300. RICHARDSON reports the case of a feeble infant, aged four months, who had never been sick, but who suddenly became

very peevish, cried almost continuously, and took very little nourishment. Three days later a slight bloody discharge appeared in the right auditory meatus. An examination showed the presence of a living worm in the right canal, which was removed with the forceps. Two large ones were likewise extracted from the left ear. The drumheads were intact.

BACON.

301. ADAMS reports the case of a child, aged three years, who, while holding the small end of a stick in her mouth, fell forward and struck the other end of the stick on the floor, driving the small end into the soft parts at the inner side of the ramus of the lower jaw on the right side. The stick was broken off, and the small end remained in the mouth. The projecting piece was removed by the mother, and measured about two inches in length. This was followed by profuse hemorrhage, and later by a discharge, and the child was unable to open its mouth to take solid food. Ten weeks later, a slight discharge appeared in the right external meatus. A piece of the stick half an inch long was removed by forceps from the auditory canal. The patient made a good recovery with apparently normal hearing.

BACON.

302. The tumor which MOURE removed from a woman forty-seven years of age, was a dark-red polypoid growth, arising from the postero-superior wall of the drum-membrane. It had a very large central cavity, and was filled with blood. Its removal was attended with considerable bleeding.

DUPUIS.

303. A boy, five and a half years old. The ear had been detached at birth by the use of the forceps. Suppuration persisted for four months, and one year after birth the canal was found to be completely closed. Three operations had been performed without result. COURTADE found a cul-de-sac extending 15 *mm* in from the tragus, and at the bottom of this a very narrow opening, passing into another cavity beyond, 7 *mm* long. Two incisions, one vertical, the other extending backward, were made through the whole length of the stenosed portion, and the canal kept open by a drainage tube 6 *mm* thick. Cicatrization in fourteen days, and permanent patency. The author advises in such cases the use of two flaps, with their bases respectively in front and behind, to cover the wound.

ZIMMERMANN.

304. CORRADI believes that ruptures of the membrane due to a fall or a blow upon the head usually lie in the peripheral part of the membrane or along the annulus tympanicus, while, as is known,

those due to a sudden change of the atmospheric pressure are generally found in the neighborhood of the umbo and the handle of the malleus. He tries to explain the reason for this difference, which may be of some importance from a medico-legal point of view.

BLOCH.

305. MATTHEWSON'S case was reported in the Transactions of the First Congress of the International Otological Society, 1876. The patient was seen at intervals, and up to 1885 there was no indication of return of the exostosis. In April, 1893, the meatus was found closed by an exostosis, filling it so completely that a probe could not be passed by it. There were also symptoms of pressure—headache, vertigo, and loss of hearing. An operation was performed for the removal of the growth by the dental engine. Instead of the "square drills," a drill known as the antrum drill was employed. This drill was found much more effective, both in perforating the growth and in enlarging the opening by lateral pressure. Up to date there has been no further trouble, and the hearing has been good.

BACON.

306. In addition to two cases of osteoma reported in the ARCHIVES OF OTOLOGY for July, 1893, GREEN adds another one. N. W., a man, aged twenty-one, in robust health, had pain in the right ear five months previously, with discharge, which continued up to his entrance in the infirmary. There was at this time a profuse discharge, and a large immovable tumor completely filled the meatus nearly to its orifice. Its insertion was apparently deep in, but could not be made out accurately. The surface of the tumor was normal skin. No perforation whistle was heard on inflation. Under ether, the auricle was turned forward and the cartilaginous separated from its attachment to the osseous meatus. The tumor was seized with forceps and by a rotary motion and considerable force was extracted without further cutting of either soft or osseous parts. The growth had evidently been attached in the tympanum or attic and these cavities were filled with pus, detritus, etc., which were removed. The auricle was replaced and stitched in position. Several months later, when examined, the drumhead had healed and the hearing was the same in each ear. The tumor removed was 15 mm long, and 12 mm wide. It was slightly nodulated and covered with a uniform thin glistening layer of cartilage, except at the point of insertion. It was composed of bone with a thin cortex and fine spongiosa within.

BACON.

MIDDLE EAR.

307. BLAKE, C. J. A foreign body forced into the middle ear. *Trans. Am. Otol. Soc.*, 1895.
308. ALDERTON, H. A. A cicatrix of the membrana tympani vibrating synchronously with the respiration and the pulse. *Annals. of Ophth. and Otol.*, Oct., 1895.
309. KOERNER, O. A new type of influenza otitis. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.
310. HOLINGER, S. Mastoiditis and sinus-phlebitis after influenza. *Chicago Med. Recorder*, Dec., 1895.
311. TANSLEY, J. O. Acute attic disease and its treatment. *Trans. Am. Otol. Soc.*, 1895.
312. SZENES, J. Should we pronounce for or against opening of the mastoid in acute cases? *Ann. des mal. de l'oreille, etc.*, No. 10, 1895.
313. VOSS. The treatment of facial paralysis following acute otitis media. *Arch. f. Ohrenh.*, xlix., p. 285.
314. KNAPP, H. On the indications for mastoid operations in acute purulent otitis media, with four illustrative cases. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.
315. BURNETT, C. H. The prevention of mastoid empyema. *Trans. Am. Otol. Soc.*, 1895.
316. BUCK, A. H. The prognosis of operations upon the mastoid process of diabetic persons. *Ib.*, 1895.
317. BLAKE, C. J. Two illustrative cases of antrum disease. *Ib.*, 1895.
318. HOLT, E. E. Two cases of otitis media suppurativa. Necrosis of the mastoid. Operation. Death. *Ib.*, 1895.
319. GRÜNWALD. Contributions to aural surgery. *Deutsche med. Wochenschr.*, Nos. 45, 46, 47, 1895.
320. REINHARD, E. The operation of opening the cavity of the middle ear. Greifswald, 1895.
321. MANN. Von Mangold's method of transplanting flaps after radical operations done for chronic suppuration of the middle ear. *Deutsche med. Wochenschr.*, No. 48, 1895.
322. LEUTERT, E. Pathologico-histological contribution to the cholesteatoma question. *Arch. f. Ohrenh.*, xxxix., p. 233.
323. WOODS, R. H. A case of purulent otorrhœa of seven

years' standing with cerebral complications. *Med. Press*, Nov. 20, 1895.

324. TREITEL. A case of multiple otitic cerebral abscess. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.

325. MOSS, R. E. Two cases of otitic brain-disease. *Ib.*, xxiv.

326. BARR, T. The treatment of intra-cranial abscesses following purulent diseases of the ear. *Ib.*, xxiv., Nos. 3 and 4.

327. ROMENY, M. B. Cerebral affections in otitis media. *Med. Weekblad*, April 20, 1895.

328. GREEN, J. O. Circumscribed periphlebitis of the jugular due to mastoiditis. *Trans. Am. Otol. Soc.*, 1895.

329. BURNETT, C. H. Aural notes in a case of intra-mastoiditis with perforation of the medial plate of the process and burrowing of pus into the post-pharyngeal region. *Phil. Polyclinic*, Nov. 23, 1895.

330. TARGETT, J. H. Excision of temporo-maxillary joint for ankylosis following otorrhœa. *Br. Med. Journ.*, Nov. 23, 1895.

331. LICHTHEIM. Upon the diagnosis of meningitis. *Berl. klin. Wochenschr.*, No. 13, 1895.

332. FÜRBRINGER, P. Upon the clinical significance of puncture of the spine. *Berl. klin. Wochenschr.*, Nov. 18, 1895.

307. A boy aged ten years thrust a foreign body into the left ear. Two attempts at extraction had been made by local practitioners, but without result. On examination, BLAKE found a hard, round, black body. Under ether two attempts to remove the body were unsuccessful. The auricle was then deflected forward and the soft tissues dissected away from the posterior wall of the canal. It was necessary to break off one tip of the object before it could be drawn out. The foreign body proved to be a piece of gas carbon, having a smooth, rounded surface on one side, and being on the other rough and concave.

BACON.

308. ALDERTON's patient, a man sixty-four years of age, complained of deafness in both ears with tinnitus for three years. Besides thickening and retraction of the drumheads on both sides, the right membrana tympani exhibited a cicatrix anteriorly and inferiorly. After the act of swallowing, the cicatrix vibrated synchronously with the movements of respiration. Shortly the air

became exhausted and the membrane rested against the promontory, upon which change in position the cicatrix vibrated synchronously with the pulse. This series of events was repeated as often as the patient swallowed.

BACON.

309. KOERNER describes a peculiar type of influenza otitis in which it seemed as if numerous granulations, of small size and originating in the mucous layer were pushing forward the drum-head from behind. In a day or two, the hammer was visible, the granulations had disappeared, and in their place were ring-like hemorrhages corresponding to the margins of the former granulating surfaces. The rings were not closed but open on one side, and on the grayish-red background of the *Mt* they offered a picture bearing great resemblance to a panther skin.

BACON.

310. HOLINGER reports a case of acute purulent otitis media following influenza, complicated by mastoid disease, in which other serious complications developed later. At the operation, there was a large abscess cavity behind the ear. The antrum contained pus but no granulations. A probe was plunged into a cavity an inch deep, entering at a point under the prominence of the Fallopian canal, in the direction of the occipital foramen. On withdrawing the probe, a quantity of pus flowed out. The granulations and bone at the entrance were carefully removed and the cavity curetted. In removing soft granulations from the dura, a second flow of blood, pus, thrombotic masses and granulations followed. The granulations had shut off the communication between the antrum and the abscess and sinus-thrombosis, from which the retention of pus and the pain pressure resulted had occurred. All around there were firm adhesions between the dura and skull. Six weeks later, the wound was closed and the suppuration from the ear had ceased.

BACON.

311. TANSLEY advises, when an inflammation is seen to exist in the superior or supero-posterior part of the drum-head passing upwards from the short process, that a free incision be made in these parts. For this purpose he uses a broad and strong cataract knife, with the cutting edge directed upwards, the point of which is caused to pierce the flaccid membrane not lower than the short process, and in the centre of the greatest inflammation. It is passed rather deeply on until bone is reached, then a strong liberal cut is made upwards or upwards and backwards, dividing the tissues for one-half or three-quarters of an inch. The external

auditory canal is at once closed with a plug of absorbent cotton. If necessary a second or third cut may be made. BACON.

312. As evidence that the indications given by Schwartz for the performance of the mastoid operation are not always applicable, SZENES tells of a case in which typical signs of mastoid involvement, namely: redness, heat, and swelling over the process, depression of the posterior wall of the canal, etc., were present, and which nevertheless went on to a perfect recovery without operation. ZIMMERMAN.

313. As a result of his experience in a case which he describes Voss advises that in marked and persistent facial paralysis the mastoid be opened in order to remove the spongy and hyperæmic tissue that may be contained in its interior. In his case the paralysis had lasted three months. BLOCH.

314. KNAPP's conclusions are:

I. There is in acute otitis media, as H. Schwartz states, no symptom which by itself constitutes a sufficient indication for a mastoid operation.

II. The indication for operating is derived from the ensemble of the symptoms and the course of the disease.

III. Even if the patient does well, and seems cured, we should for weeks and months, not lose sight of him, for acute purulent mastoiditis is a treacherous disease.

IV. Whatever the symptoms be, we should, as a rule, begin the operation by opening the antrum, and then be guided by the conditions coming into view. BACON.

315. BURNETT considers that in many cases of acute otitis media, the disease in the middle ear is often a result of the treatment of the naso-pharyngeal disease rather than that of the latter disease itself. He advises *never* to inflate the ears, by any method in either acute nasal or aural disease, because it is both painful and injurious. He considers that dry heat will never do any harm and may give relief. An instillation of ten drops of a warm watery solution of carbolic acid (1.50 to 2.00 per cent.), or of bichloride of mercury (1:10,000), may also give relief. Such applications tend to destroy staphylococci. As soon as the drum-head is perforated and a discharge sets in, or where the membrana tympani has been punctured, a strip of iodoform or carbolic gauze should be inserted in the auditory meatus and the same left in situ for twenty-four hours. The writer strongly advises against all syringing, instillation of drops, all insufflation of pow-

ders, etc. When dry heat gives no relief to pain, the membrana should be incised at once and drained antiseptically. When operating for mastoid disease, great care should be taken that all carious and necrotic tissues are removed from the middle ear.

BACON.

316. BUCK gives a brief review of ten cases of mastoid disease occurring in diabetic persons which have already been reported by different writers, and gives the histories of four cases which came under his own observation. He believes that a study of the ten cases is sufficient to establish one or two facts of practical importance, viz. : first, that disease of the mastoid process is likely to be a more serious affair in persons affected with diabetes melitus than in those who are in ordinarily healthy condition ; and second, that the destructive processes within the temporal bone tend to advance at a more rapid rate in diabetic than in non-diabetic individuals.

Of the four cases reported by the writer, two died and two recovered. The conclusions are that "it is imperative that mastoid operations upon diabetic persons shall be performed at a comparatively early stage of the disease in the temporal bone ; that is, before the lateral sinus or the dura mater has become seriously involved."

BACON.

317. BLAKE's *first case*, a boy, ten years of age, had an acute inflammation of the middle ear, with serous discharge, which had ceased spontaneously. The pain recommenced and was very severe, and on the second day was accompanied by some fever. A crescentic incision in the superior posterior portion of the drumhead failed to give any permanent relief. Under ether, the mastoid was opened and a soft spot of bone in the antrum was reached and curetted away. There was immediate relief and a speedy recovery.

The *second case* was that of a woman aged fifty-two, who had an acute inflammation of the left middle ear three months previously. There was a recurrence of pain, which persisted, and a tender spot just over the antrum. A soft spot of bone was curetted away in the antrum, and the patient rapidly recovered.

BACON.

318. HOLT's *first case* was that of a man aged fifty-one, who had had an earache several weeks previously, followed by a discharge, which had ceased when he first came under observation. When examined there was found a discharge from the left ear, some swelling of the mastoid, and slight rise of temperature.

After eleven days of treatment, it became necessary to make an incision over the mastoid process, when a carious opening leading into the cells was discovered. Later he developed a bronchitis, had a chill, and temperature of 102° F. There was pain in the wound, which reopened. Urine contained albumin. The lower part of the mastoid process was chiselled away, leading to an abscess cavity around and behind the sterno-mastoid muscle. The antrum was opened and the bony wall of the lateral sinus was considerably destroyed. The urine became loaded with albumin. The patient died two days later.

CASE 2.—Patient, aged sixty-three, gave a history of pain in both ears of five or six weeks' duration, and a discharge from both ears which lasted for four weeks, but when first seen by the writer, the drumheads showed only a slight congestion. He complained more of the right ear, and that he was dizzy at times and unable to walk. Pain developed behind the left ear, an operation became necessary, and a carious opening was found in the outer plate of the mastoid. He subsequently had a chill, fever, and he vomited. The wall of the lateral sinus was found destroyed. The patient died, but no autopsy was obtained.

BACON.

319. GRÜNWALD discusses at length the question of excision of the ossicles, giving various illustrative cases. He criticises Gomperz's work on the same subject and declares that from the latter's statements we may conclude that "not a single case is known in which, if there was any reason for doubt before the operation as to the possibility of cure, a cure, nevertheless, resulted, contrary to expectation." He regards extraction of the malleus as especially likely to produce an improvement of hearing and relief of tinnitus, when a preliminary paracentesis or tenotomy has exerted a similar favorable effect. Even in sclerosis the author thinks that he has had many excellent results.

Lastly, Grünwald considers the after-treatment of the radical operation for chiselling the mastoid with immediate closure of the wound, and comes to the doubtless correct conclusion that "the radical operation upon the mastoid with the removal of the bony wall of the auditory canal renders it unnecessary to have a persistent opening behind the ear."

In an appendix Grünwald speaks of Körner's method of forming flaps by two horizontal incisions as almost identical with his own. The latter, however, as is evident from his description, is

made with but one horizontal incision combined, if necessary, with a vertical one.

NOLTENIUS.

320. REINHARD gives a full account of the history of the operations for exposing the tympanic cavity, beginning with the original mastoid operation as performed by Petit, Morand, and Jasser, then describing fully Schwartz's operation, and lastly the more recent methods of Küster, v. Bergmann, Zaufal, Jansen, Stacke, Stacke and Schwartz, Körner, Siebenmann, Kretschmann, and his own. He then describes ten cases that were operated upon. It is not apparent that an adequate attempt was made to cure the cases by ordinary measures before an operation was resorted to.

Case 9 was in a tuberculous patient, with chronic offensive discharge, headache, and tenderness of the mastoid. The latter, when chiselled, was found to be destroyed down to the dura, which was studded with granulations and tubercles. The process was so extensive that the operation practically amounted to a total resection of the mastoid. A subsequent operation was required, in which the attic was laid open, and its contents removed. The case resulted favorably.

Case 10 was that of a patient with acute otorrhœa, headache, and retro-auricular pain. The entire mastoid was extremely tender to pressure, and later also became reddened and infiltrated. On making the cutaneous incision there was marked venous bleeding, and, when the mastoid was opened, it was found to be reddened and discolored, and contained offensive pus. As the attempt was made to remove a piece of necrosed bone, a pulsating jet of venous blood, as thick as the thumb, spurted out. This was controlled by digital compression and a tampon, and when the dressing was changed five days later there was no bleeding. Three days after this the temperature suddenly rose to 40° C., there was violent headache, and a hard swelling appeared along the course of the jugular vein. The sinus was exposed, and found to contain a little blood and a thrombus which showed purulent discoloration. No attempt was made to ligate and open the jugular. Three weeks later chills, stupor, delirium, and death.

HARTMANN.

321. MANN scrapes the carefully cleaned skin of the forearm with a sterilized razor, removing the cutaneous tissues down to the papillary layer, and transfers the mixture of epidermis and blood to the raw surface that he wishes to cover. This latter

must have all granulations and blood removed from it. A strip of protective is placed over the epithelial graft to prevent evaporation, and to keep the graft from sticking to the dressing. The author applies this method to the raw surface made in the cavity of the middle ear by operation, and believes that he can by this means secure epidermization in three weeks, provided that all morbid matter has been actually removed before the graft is applied.

NOLTENIUS.

322. LEUTERT, in harmony with the prevalent notion as to the origin of cholesteatoma, attempts to prove that the latter is not the result of inflammatory over-growth of the epidermis which penetrates into the middle ear, but is due to the formation of retention-cysts. In support of this idea he cites one case of a man who had been operated upon four years before, and in whom a small cholesteatomatous pearl was found completely encapsuled in a dilated pneumatic cell. The epidermis was separated from the epidermoidal matrix of the tumor by a thin layer of connective tissue, so that the growth presented an instance of a retention-cyst like those which have been observed or have been experimentally produced in other parts of the body by Kaufmann and others. Structures of this character may, for reasons readily intelligible, be found as recurrent growths after operations: but they may also occur primarily in the course of chronic suppuration. In any case, the author's observations support the theory that cholesteatoma is due to the fact that pavement epithelium makes its way through perforations in the drum-membrane into the tympanic cavity, where then it continues to develop. It then makes very little difference whether the masses of desquamating, cornified epithelium are pent in and kept from escaping from the mastoid by bony walls or by a soft layer of cutaneous tissue which encloses them.

BLOCH.

323. In Woods's case the antrum was found full of pus and granulation tissue with cholesteatomatous debris. An extra-dural abscess, with sinus-thrombosis and a temporo-sphenoidal abscess were also found. The patient was doing well.

CHEATLE.

324. TREITEL's case was that of a young man aged twenty-two years, who had had a chronic otorrhœa from scarlatina since childhood, and who developed grave cerebral symptoms. At the autopsy there was found an abscess in the lower surface of the right temporal lobe. There was also a large abscess in the poste-

rior portion of the temporal lobe and adjacent portion of the occipital lobe, together with several smaller ones farther behind in the occipital lobe. Mastoid sclerosed. BACON.

326. In this address at the International Otological Congress held at Florence in 1895, BARR reviews in detail the history of operations on the cranial cavity following diseases of the ear. He describes the methods of operating and he discusses the various cranial complications, viz.: extra-dural abscess, septic thrombosis of the sigmoid sinus, intra-dural abscess, cerebral and cerebellar abscesses, and mixed cases of intra-cranial disease.

BACON.

327. ROMENY gives a description of an abscess developing in the temporal lobe in a chronic otitis media of the same side. On operation offensive pus was evacuated, but the patient died. A minute perforation of the tegmen tympani was found on autopsy and a communication between the tympanic cavity and transverse sinus. MEYJES.

328. GREEN reports a case of a young man aged twenty-eight years, who was first seen July 1, 1891, and who gave a history of having had typhoid fever five weeks previously. At the beginning of the so-called typhoid, there was pain and swelling behind the right ear, which gradually extended down the neck just in front of the sterno-cleido-mastoid muscle. Ten days before his admission there was a slight chill, and a few days later a rigor. An examination showed the usual symptoms of middle ear and mastoid disease and great tenderness along the anterior edge of the sterno mastoid muscle, but no indurated cord could be felt. The mastoid operation was performed and this afforded relief for a few days. Later he had a rigor, fever, and vomited. The neck was then examined and on opening the sheath of the jugular vein a few drops of pus were evacuated. There was no thrombus. From this time there was a speedy recovery. BACON.

329. The case reported by BURNETT was that of a physician sixty-two years of age who had a chronic purulent otitis media of the left side which was further complicated by mastoid disease. A Wilde's incision liberated some pus and at the same time an incision was made into the attic through the membrana flaccida. After this, he returned to his home feeling well for a month. At the end of this time he found that his neck beneath the ear, in the line with the sterno-cleido-mastoid muscle was swollen and brawny, and that he could force pus through the aural meatus

both by distention of the buccinators and by pressure over the brawny region on the side of the neck beneath the ear. The bottom of the pus cavity was formed by the superior constrictor of the pharynx in this case. The floor of the auditory meatus was found to communicate with the post-pharyngeal collection of pus. An incision was made by the same surgeon behind and below the mastoid in the nuchal region and pus was evacuated. When seen by Burnett, the patient had pyæmic symptoms. The external auditory canal was narrowed. There was a remnant of the drumhead. Valsalvian inflation forced a few bubbles from the drum cavity as well as air and pus from the perforation in the cartilaginous floor of the meatus and from the perforation in the neck below and behind the mastoid. Dr. W. W. Keen operated on the patient and found a large odorless pus-cavity in the pharyngeal region, and which he evacuated through an incision beneath the jaw, the mastoid cortex being first removed and the antrum exposed. The patient recovered but with loss of hearing.

BACON.

330. At a meeting of the Hunterian Society TARCETT showed a boy aged five years with good movement of the jaw after excision of the temporo-maxillary joint, which had become ankylosed as a result of implication from middle-ear suppuration.

CHEATLE.

331. Starting with the assumption that there is no such thing as a purely cerebral or a purely spinal meningitis and that the communication between the various subarachnoid spaces must serve to effect the transportation of inflammatory germs and the dissemination of the inflammation itself along the cerebro-spinal axis, LICHTHEIM regards Quincke's puncture of the subarachnoid space as an important diagnostic aid in determining the presence of meningitis. For more than two years he has employed this procedure, using it in a number of cases, and in all but one he has by means of it succeeded in establishing the diagnosis. In the pus withdrawn by the puncture micro-organisms, particularly streptococci, but in one instance pneumococci, could always be readily demonstrated by cultivation or staining. In one case of traumatic meningitis the fluid withdrawn by the puncture, although turbid, contained no micro-organisms, although the circumscribed infiltrations of pus in the pia contained numerous streptococci. In tuberculous meningitis the method is particularly valuable, since tubercle bacilli were always present in the

aspirated fluid. The bacilli, to be sure, are usually scanty, and the fluid is generally to all appearances quite clear.

In conclusion Lichtheim states that the method is readily applicable and free from danger, although not of course to be employed without taking proper aseptic precautions.

VON WILD.

332. FÜRBRINGER has employed Quincke's puncture in 86 cases. His method differs somewhat from that of Quincke himself in that he places the patient in a sitting posture and introduces the needle in the median line and precisely at the level of the spinous process of [one of the lumbar] vertebræ. The quantity of fluid evacuated may vary from a few drops to 100 cu. cm. In 37 cases of tuberculous meningitis he found tubercle bacilli in 30. The bacilli are usually found in the fibrinous coagula contained in the fluid.

As a means of diagnosis this procedure is of the highest value; as a therapeutic measure it seems to be of little account.

VON WILD.

INTERNAL EAR.

333. WEST, SAMUEL. Case of cerebral tumor in which the initial symptoms were chiefly sensory in the arm and face. Sudden aggravation with loss of hearing in corresponding ear. *Brain*, pts. lxx. and lxxi., 1895.

334. SCHEIBE, A. Anomalies of formation of the membranous labyrinth in deaf-mutism. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.

335. SCHEIBE, A. A histological contribution to deaf-mutism due to otitis interna. *Ibid.*, xxiv., Nos. 3 and 4.

336. LEMARIEY, A. Ménière's syndrome cured by pilocarpine. *Ann. des mal. de l'oreille, etc.*, No. 11, 1895.

333. WEST's case was that of a boy aged sixteen years, who shortly before death had loss of power in the left arm and leg with deafness in the left ear. The notes as regards the aural symptoms are unfortunately very vague, the author only stating that "he could only hear a watch one inch away with the left ear, while the hearing on the right side was fairly acute." At the post-mortem a tumor (gliosarcoma) the size of a walnut was found lying in the white matter on the outer side of the lenticular nucleus, surrounded by softening which extended backwards into the occipital lobe and downwards somewhat into the temporo-sphenoidal lobe.

CHEATLE.

334. SCHEIBE reports the results of an anatomical examination in the case of a deaf-mute, aged eleven years, who died after a six-weeks' illness from scarlet fever and dropsy. As a result of his examination and of others made by him, he concludes that "in all cases heretofore published the malformation of the labyrinth involved the osseous capsule. Our case shows that an arrest of development may be confined to the membranous labyrinth, the osseous portion being normally formed." BACON.

335. The case reported by SCHEIBE was that of a boy eight and a half years old, who died from scarlet fever with diphtheria. He became deaf in his fourth year from a brain disease. There was no heredity in his case. A post-mortem examination was made the day after death. A histological examination was made of both temporal bones. In both ears a recent otitis media was the result of scarlet fever with diphtheria during the weeks immediately preceding death. The destructions in both labyrinths were of older date and sufficed to account for the deafness, that led to deaf-mutism. They were to be considered as sequels of inflammation. BACON.

336. In LEMARIEY's case of Ménière's disease, the use of pilocarpine increased the hearing distance from 25 to 100 *cm* and abrogated the vertigo and tinnitus. Relapses occurring respectively one and three months later were cured by quinine

ZIMMERMANN.

NOSE AND NASO-PHARYNX.

337. THOMPSON, ST. CLAIR, and HEWLETT, P. T. Micro-organisms in the healthy nose. *ARCH. OF OTOL.*, xxiv., Nos. 3 and 4.

338. OTT, C. Upon changes of the lips due to mouth-breathing of long standing. *Arch. f. Laryng.*, ii., 3.

339. GUYE, A. A. G. Upon the occurrence of a dental calculus upon the incisor tooth as a result of habitual mouth-breathing. *Tydschr. voor Geneesk.*, No. 6, 1895.

340. COLLIER, M. Some effects of chronic nasal obstruction. *Med. Press and Circ.*, Nov. 20, 1895.

341. MACDONALD, GREVILLE. Spasmodic asthma and nasal troubles. *Br. Med. Four.*, Nov. 7, 1895.

342. WALDOW, A. Investigations upon the malformations of the jaw due to obstruction of nasal respiration. *Arch. f. Laryngol.*, iii., p. 233.

343. SIKKEL. Upon the treatment of epistaxis. *Med. Weekblad*, No. 44, 1895.
344. FINCK, E. On hydrorrhœa nasalis. *Wien. med. Presse*, Nos. 42 and 43, 1895.
345. HAMON DU FOUGERAY. A case of primary acute purulent rhinitis in an infant, due to staphylococci, and cured by the use of a 10 per cent. mentholated oil. *Ann. des mal. de l'oreille, etc.*, No. 12, 1895.
346. FAYE. Bacteriological diagnosis of ozæna. *Rev. de laryng.*, No. 19, 1895.
347. CHEVAL. Treatment of ozæna by interstitial electrolysis. *Fourn. de la soc. des. sc. méd., etc.*, (Brussels), No. 25, 1895.
348. WRÓBLEWSKI, L. Acute abscesses of the nasal septum. *Arch. f. Laryngol.*, ii., 3.
349. KRETSCHMANN. Upon the treatment of deflections of the nasal septum by means of the trephine. *Ibid.*, ii., 3.
350. RIPAUT, H. A case of confluent papilloma of the nasal fossæ. *Ann. des mal. de l'oreille, etc.*, No. 12, 1895.
351. STIEDA, A. Upon bone-cysts in the nose. *Arch. f. Laryngol.*, iii., p. 359.
352. STEWART, W. R. H. A very large fibroma of nasal septum. *Br. Med. Fourn.*, Dec. 28, 1895.
353. BIEHL. Upon the pathology of bleeding polypi of the septum. *Monatsschr. f. Ohrenh.*, No. 6, 1895.
354. LAVRAND, H. Fibro-mucous polyp of the left posterior naris, hanging down into the pharyngeal cavity and detached by way of the nasal fossa after malaxation. *Fourn. des sc. méd. de Lille*, Oct., 1895.
355. LUC. Upon the etiology of mucous polypi of the nasal fossæ. [Communication to the British Medical Association, 1895.]
356. WATSON, S. Case of nasal polypi associated with tachycardia. *Br. Med. Fourn.*, Nov. 2, 1895.
357. JULER, H. E., and SMALL, M. A. A case of acute orbital cellulitis following a dental abscess. *Ibid.*, Oct. 19, 1895.
358. DMOCHOWSKI, Z. Contribution to the pathological anatomy and the etiology of the inflammatory processes in the antrum of Highmore. Prize essay. *Arch. f. Laryng.*, iii., p. 255.
359. AVELLIS. Some brief clinical remarks relative to our knowledge of empyema of the maxillary sinus. *Ibid.*, ii., 3.

360. SNELL, S. Distention of the frontal sinus. *Clin. Sketches*, Nov., 1895.
361. RIPAUT, H. Three cases of empyema of the frontal sinus. *Ann. des mal. de l'oreille, etc.*, No. 11, 1895.
362. BROWN, W. H. A case of fracture of the ethmoid bone with basal meningitis. *Lancet*, Dec. 14, 1895.
363. TILLEY, H. Three cases of parosmia ; causes, treatment, etc. *Ibid.*, Oct. 12, 1895.
364. STOKER, G. A method of removing naso-pharyngeal tumors to prevent bleeding from the pedicle. *Br. Med. Journ.*, Nov. 2, 1895.
365. BOYD, S. Temporary resection of the upper jaw for naso-pharyngeal tumors. *Ibid.*, Nov. 16, 1895.
366. PYE-SMITH, R. I. Canine tooth embedded in anterior wall of maxillary antrum for two years. *Ibid.*, Oct. 24, 1895.
367. DAAE, H. A supernumerary tooth which was found in the nose. *Arch. f. Laryng.*, ii., 3.
368. NEUMAYER, H. A case of tuberculosis of the buccal cavity, maxillary sinus, and nose. *Ibid.*, ii., 2.
369. MEYER, W. Adenoid vegetations, their prevalence and antiquity. *Arch. f. Ohrenh.*, xl., p. 1.
370. ANSLAU, Y. Statistical contribution to the study of adenoid vegetations of the rhino-pharynx. *Ann. des mal. de l'oreille, etc.*, No. 11, 1895.
371. SIKKEL, A. Acute infectious phlegmon of the pharynx. *Nederl. Tydschr. voor Geneesk.*, No. 21, 1895.
372. LICHTWITZ, L. A case of angioma of the pharynx. *Monatsschr. f. Ohrenh.*, No. 9, 1895.
373. LICHTWITZ, L. Upon the removal of hypertrophic tonsils by means of the hot electric snare. *Arch. f. Laryng.*, ii., 3.
374. RÉTHI, L. Upon the nature and etiology of spontaneous pharyngeal hemorrhages. *Wien. klin. Rundschau.*, No. 52, 1895.
375. THOMPSON and HEWLETT's results are summarized as follows : In all bacteriological investigations of the nasal fossæ a clear distinction must be made between the vestibule of the nose and the mucous cavity proper, as the former is lined with skin and is not part of the nose-cavity proper. Neglect of this distinction may account for the discrepancy in previous observations on the subject.

In the dust and crusts of mucus and débris deposited among the vibrissæ of healthy subjects micro-organisms are always found. On the Schneiderian membrane, on the contrary, the occurrence of pathogenic organisms is so infrequent that their presence can only be regarded as quite exceptional.

BACON.

338. OTT observed that in four mouth-breathers, in whom extreme nasal obstruction had existed for a long time, the mouth-breathing persisted even when the obstruction was removed. This he ascribes to the fact that the lips had become too short as a result of atrophy or insufficient action of the orbicularis oris, brought on by disuse. Systematic exercise, massage, and electricity are recommended as therapeutic measures. ZARNIKO.

341. In the course of a discussion on spasmodic asthma at the Harvey Society, MACDONALD stated that of 30 cases of the disease associated with nasal troubles treated by him 20 were relieved, of which 12 were practically cured; 4 had septal deformities, 6 vascular turgescence of inferior turbinals, 4 polypi, 4 adenoids, and 2 œdematous swelling over the upper and anterior portion of the triangular cartilage. The remaining 10, which were not relieved, had polypi. CHEATLE.

342. WALDOW demonstrates the malformations of the jaw due to adenoid vegetations by means of plaster casts. He shows that these malformations must, as Körner says, be distinguished into two categories, viz., those occurring before and those occurring during the period of development of the permanent teeth. In the first period the palatal arch is dome-shaped and the longitudinal axis of the superior maxilla is elongated, but the teeth are normally placed; in the second period the palate forms a pointed arch, the jaw presents a V-shaped indentation in the median line, and the teeth are abnormally disposed. DUPUIS.

343. SIKKEL believes that the origin of epistaxis is in almost every case the anterior portion of the septum. The use of the anterior tampon, after a preliminary cauterization with chromic acid, has proved completely satisfactory in his practice. He does not use the liquor stypticus (solution of chloride of iron), since it fills up the nose with a dirty coagulum. Mackenzie's solution, on the other hand, has always proved reliable; and he speaks well of the hæmostatic action of oil of turpentine. MEYJES.

344. According to FINCK nasal hydrops, occurring independently of the presence of inflammatory germs, is a functional

neurosis of the terminal branches of the trigeminus, which supply the mucous glands of the nose and accessory cavities. In the presence of this neurosis any slight irritation will produce excessive secretion from the mucous glands. Removal of the hypertrophied extremities of the inferior turbinates produces no lasting effect. Finck recommends local treatment with exsiccant remedies such as aristol.

POLLAK.

345. HAMON DU FOUGERAY'S patient, a boy of thirteen months, had rhinitis with much purulent discharge from the nose, high fever (40° C.), vomiting, and prostration of the most serious character. The pus contained the staphylococcus albus and aureus. The application of a ten-per-cent. solution of menthol in oil six times a day to the nose and throat effected a cure.

ZIMMERMANN.

346. In cover-glass preparations made from the secretion of ozæna FAYE found, besides Löwenberg's microbe, numerous other bacteria. He differs with Löwenberg as regards the odor exhaled by cultures of the ozæna bacillus, which, Faye says, is very unpleasant, like that of bed-bugs. The bacillus, according to Faye, is found not only in the nose, but also in the pharynx, larynx, trachea, and conjunctival sac. He thinks that it also probably gets into the blood-vessels. It is present only in true ozæna. In many animals injections of the cultures cause death.

DUPUIS.

347. Electrolysis, on account of its atrophying effect upon the mucous membrane, would *a priori* seem to be absolutely contra-indicated in ozæna, where the membrane and bony framework beneath are already reduced to a minimum. Nevertheless, CHEVAL found that of 90 cases of ozæna in hospital practice, 70 were cured in one sitting and 12 after several applications; 1 very severe case was improved after six applications separated by intervals of two weeks and three months; 2 were unimproved, 2 failed to return, and 3 were still under treatment. This gives 90 per cent. of cures. The average length of treatment is two weeks. The treatment gives the patient very little inconvenience. Cheval uses silver needles.

DUBAR.

348. WRÓBLEWSKI has observed as many as 14 abscesses of the septum, of which 6 were due to injury, 1 to typhus, and 1 to small-pox, while 5 were of the so-called idiopathic variety. Besides giving an account of these cases he considers the origin, diagnosis, and treatment of the conditions in general. He was

fortunate enough never to meet with a perforation of the septum from this cause ; but observed that if a large part of the cartilage is lost, external disfigurement (sinking in of the bridge of the nose) is very apt to occur.

ZARNIKO.

349. KRETSCHMANN, having tried Spiess's operation in 25 cases, pronounces it satisfactory. In 4 cases he had severe secondary hemorrhage, which required the application of the posterior tampon. Recently, therefore, he has, twenty-four hours after the operation, applied a tampon of iodoform gauze.

ZARNIKO.

350. In RIPAULT's case (a man thirty-six years old), there was a papilloma extending from the right nasal orifice 2 *cm* into the cavity of the nares and completely occluding the latter. Removed with sharp spoon and cauterized with lactic acid.

ZIMMERMANN.

351. In STIEDA's first case (a girl sixteen years of age), the whole right side of the nose was blocked up by means of two bone-cysts, one having the size of a hen's egg, the other that of a cherry. These communicated with each other and were filled with pus. The mucous membrane covering these cysts exteriorly was like the nasal mucous membrane ; the interior mucous membrane was destitute of mucous glands, was provided with both ciliated and pavement epithelium, and showed a few small polypi. The bony wall of the cyst was lamellated, covered outside and in with periosteal connective-tissue fibres, and presented evidences of active growth in the shape of osteoblasts. In the second case (a girl of nineteen), a bone-cyst projected from each middle turbinated. The exterior mucosa was quite thick, and there was marked proliferation of the mucous glands. In the vessels both intima and adventitia were much thickened.

DUPUIS.

352. At a meeting of the Laryngological Society of London, held December 11, 1895, STEWART showed a fibroma which measured 4 by 2½ by 1½ inches. The upper jaw had to be turned back to allow room for removal. This is the largest fibroma of the nasal septum which has yet been recorded. The operation was performed by Macready.

CHEATLE.

353. BIEHL describes two cases of "bleeding polypi of the septum," one in a girl of nineteen, the other in a woman of forty-seven. The tumors, which in both cases sprang from the anterior wall of the septum, consisted essentially of cavities varying in size and filled with blood, and of blood-vessels, surrounded by sparse connective tissue and covered with cylindrical or pavement

epithelium. They are, therefore, to be regarded as cavernous angiomas.

DUPUIS.

354. LAVRAND, after removing polypi from the nose of a child of fourteen, found behind the latter a firm, movable, pear-shaped tumor attached to the top of the left middle turbinated and extending backward into the naso-pharynx, where it more or less completely occluded both choanæ. The tumor could not be removed directly owing to lack of space to operate in. Lavrand then sought to diminish its size by malaxation (kneading) as recommended by Waquier. This he succeeded in doing in spite of the resistant character of the tumor, and then succeeded in grasping the latter with the polypus forceps and in pushing it back into the naso-pharynx, from which it was expectorated by the patient.

DUBAR.

355. LUC, after briefly considering, first, the theories of Ziem, who lays stress upon the frequency with which nasal polypi co-exist with suppuration in the sinuses, and, second, the connection, alleged by Woakes to exist between nasal polypi and necrosing ethmoiditis, contests the right of the latter disease to be regarded as a morbid entity. He also speaks of the co-existence of polypi with veritable new growths. According to his ideas, the frequency with which polypi occur in the region of the middle turbinated, the middle meatus, and especially the meatus semilunaris, is due to the fact that in these situations the mucous membrane is more full of folds and depressions than upon the lower turbinated. This favors the development of a pediculate tumor whenever œdematous distention (which is the first stage of myxomatous degeneration) occurs in these spots, while in places where there are no such folds the same process results in the formation of a diffuse swelling.

DUBAR.

356. In SPENCER WATSON'S case the tachycardia was completely cured after the removal of polypi from both nasal fossæ.

CHEATLE.

357. In the Section of Ophthalmology at the meeting of the British Medical Association, JULER and MORTON SMALL read the notes of a case in which the eye was lost owing to acute chronic orbital cellulitis, the inflammatory process having extended through the antrum of Highmore from an abscess at the root of an upper molar tooth.

CHEATLE.

358. DMOCHOWSKI considers the true shape of the antrum of Highmore to be that of an irregular cube, having therefore six

sides, viz., an upper, lower, anterior, posterior, internal, and external. After an exhaustive review of the literature of the pathology of the cavity he describes his own results as obtained from the examination of 152 cadavers. In 28 of these the mucous membrane showed morbid changes, including 12 cases in which there was suppuration. He also examined 6 cases in which pus could be withdrawn from the antrum by paracentesis. On the basis of these observations he gives the following classification of antral diseases :

1. Acute catarrhal inflammation.
2. Chronic catarrhal inflammations with their sequelæ (cysts, polypi, osteomata, hydrops, inflammations).
3. Purulent inflammation, acute and chronic.
4. Diphtheritic inflammations.
5. Specific inflammations (syphilitic, tuberculous).

In the 18 suppurative cases he found besides various non-pathogenic microbes the following : *Staphylococcus pyogenes aureus* (3 cases), *Bacillus pyogenes fœtidus* (10 cases), *Streptococcus pyogenes* (3 cases), *Pneumococcus* of Friedländer (2 cases), *Bacillus pyocyaneus* (1 case).

DUPUIS.

359. AVELLIS's article shows how varied may be the symptoms due to empyema of the maxillary sinus. They include obstinate gastric disease, due to swallowing of the fetid pus ; a sensation of something dropping down in the skull when the patient tried to sew, and painless œdema fugax of the cheek. The author further mentions a case in which, although the natural orifice was patent and irrigations were being performed, the empyema burst through the cheek, and a case in which cauterization of a spot in the vicinity of the ostium of the maxillary sinus produced an acute empyema of the latter, which was cured by perforating the canine fossa and making irrigations—five only of the latter being required. In conclusion he considers the chances of a spontaneous cure taking place in an acute empyema, and recommends that the cavity be entered as soon as the diagnosis is made.

ZARNIKO.

360. SNELL describes the symptoms of distention of the frontal sinus and gives the notes of two cases. In each there was a swelling at the inner orbital angle. Recovery occurred after opening at the site of the swelling and the establishment of free communication with the nose. He states that few cases occur under twenty years of age, as in children the sinus is not developed.

CHEATLE.

361. RIPAULT describes three cases of empyema of the right frontal sinus (in the third case the left sinus being also affected by perforation of the septum). In the first case there were nasal obstruction with discharge from the nose, a polypus recurring repeatedly after removal, headache, epileptiform attacks, transient swelling of the upper lid, and simultaneous empyema of the maxillary sinus. Cured. In the second case the nose was normal, but there was exophthalmus with complete atrophy of the optic nerve, and there were fistulæ proceeding from the sinus, which was filled with fungous masses. Cured. In the third case there were nasal occlusion from a sarcoma, fistulæ at the inner edge of the orbit, infiltration of the upper lid, and exophthalmus. Death from meningitis of the convexity. The author's plan of treatment in cases of frontal sinus disease is to make a large opening, curette the cavity thoroughly, and drain into the nose.

ZIMMERMANN.

362. At the Leeds and West Riding Medico-Chirurgical Society, November 29, 1895, BROWN showed a boy aged sixteen years who had received a blow on the occipital region, fell forwards, and struck his forehead violently on the ground; on the third day after the fall a copious discharge ran from both nostrils and continued for six days; and although he was extremely ill with meningitis, he eventually recovered.

CHEATLE.

363. In TILLEY's three cases of parosmia, the first followed influenza and was cured by nerve-tonics and intra-nasal spray of strychnine solution \mathfrak{M} x ad $\mathfrak{3i}$ applied daily; the second complained of the constant smell of tallow candles for which no cause could be found; and the third, a climacteric woman, complained of a foul smell in the nose also with no recognized local trouble.

CHEATLE.

364. STOKER's method consists in first applying a ligature of whipcord as close to the base of the tumor as possible through the nose, the whipcord being tightly twisted by means of an instrument which he has invented for the purpose; the tumor is then removed by the ordinary means below the ligature, which remains in situ for as long as is thought necessary.

CHEATLE.

365. At a meeting of the Medical Society of London, held November 11, 1895, BOYD showed a man aged forty-nine whose superior maxilla he had temporarily resected for the removal of a naso-pharyngeal tumor which was found to be growing either

from the base of the skull or front of the spine, and had blocked and bulged the right nostril and displaced the right eye.

CHEATLE.

366. In PYE-SMITH's case the tooth had been displaced owing to a kick at football, and a sinus had existed ever since; healing occurred after operation.

CHEATLE.

367. A woman, fifty-three years of age, suffering from ozæna, had in the floor of her left nasal fossa a supernumerary tooth, which DAAE removed. The germ of this tooth had evidently slipped from the oral into the nasal cavity before the time of closure of the palatal fissure.

ZARNIKO.

368. NEUMAYER reports the case of a man, thirty-seven years of age, affected with phthisis pulmonalis, in whom the extraction of the first molar tooth led to tuberculous infection of the gums, the buccal mucous membrane, the hard palate, and the mucous membrane of the maxillary sinus (which was opened by the extraction of the tooth); from the sinus the infection spread to the nose. The diagnosis was confirmed by the microscopical examination of the granulation masses excised from the gums and nose. Pharynx and larynx healthy. Sputum full of bacilli.

ZARNIKO.

369. Although some of the earlier rhinologists, such as Czermak, Türck, Semeleder, Voltolini, and Löwenberg, had observed adenoids by rhinoscopy, MEYER was the first (in 1867) to prove that these tumors, which had been seen to occur so frequently, were of one and the same character, and also to prove their great significance. As to their prevalence they have been found in the Esquimos of Greenland, in the Indians of Dakota and Montana, in the white population of the United States, and in all European countries. In China they are frequent both among the Mongolian and the mixed (Portuguese and Chinese) races. They have also been observed in Siam and Sumatra and other islands of the Indian Archipelago. Whether they occur in the Ethiopian races is not known. Alike in Europe, Asia, and America, they are more frequently met with in cold than in warmer climates.

It seems quite certain from the delineation of their physiognomy and from various recorded facts, that the sculptor Canova and the Emperor Charles V. suffered from adenoids. Whether, as Potiquet assumes, Francis II. of France, who died in 1560, also had adenoids, is not so certain, although probable. We have no evidence to show that it existed among the ancient Egyptians

and the Greeks, but Meyer found in the Vatican three busts of the ancient Romans which presented all the marks of the adenoid physiognomy.

It redounds vastly to Meyer's credit that he should have been the first to point out the true significance of a disease so widely prevalent and which evidently has existed from ancient times. In so doing he became one of the greatest benefactors of the human race.

BLOCH.

370. ANSLAU found that of 4,080 patients, 10 per cent. had adenoids, and of these more than one half were operated upon. He operates in one sitting, using Moritz Schmidt's instrument and ethyl bromide as an anæsthetic.

371. SIKKEL believes acute infectious phlegmon of the pharynx to be due to a lesion of the mucous membrane of the pharynx with subsequent infection. He describes a case of this sort which, like all the others on record, ended fatally. Autopsy showed general purulent infiltration of the pharynx, œsophagus, and larynx. The cause of death was not asphyxia due to the laryngeal swelling—for tracheotomy was performed early,—but was the result of the general infection, evidences of which were found in the presence of albuminuria and of swelling of the spleen. Sikkel compares these cases with the infectious angina of the French, in which the typhoid symptoms and pharyngeal swelling are less marked, but in which the mucosa of the larynx is also implicated. Infectious phlegmon can scarcely be confounded with angina Ludovici. In the latter sodium salicylate has been used with success, but in acute infectious phlegmon of the pharynx all treatment is useless.

MEYJES.

372. LICHTWITZ in a girl of sixteen found between the tonsil and the posterior pillar of the fauces a brownish or bluish sessile, non-pulsatile tumor, having a nodular surface. Below, this was continued on the posterior wall of the pharynx where it formed a black macular patch. Only three similar cases (those of Crocker, B. Fränkel, and Loomis) are described in literature.

DUPUIS.

373. LICHTWITZ is an ardent advocate of the use of the galvano-cautery snare in removing the tonsils. He argues that the advantages of the snare over the tonsillotome are that it adapts itself better to the shape of the tonsil and prevents bleeding; while, as compared with galvano-puncture and electrolysis, it has the advantage of taking only a few seconds. A full description of the apparatus necessary is given in the original.

ZARNIKO.

374, According to RÉTHI, changes in the vessels (dilatation of pre-existing vessels, new formation of capillaries) play the chief part in the production of pharyngeal hemorrhage, although moderate degrees of stasis and acute relapses of catarrh, with consequent congestion and increase of vascular pressure, are also of moment.

POLLAK.

BOOK REVIEWS.

Dr. OTTO KÖRNER: **Die Otitischen Erkrankungen des Hirns, der Hirnhäute und der Blutleiter.** (The Otitic Diseases of the Brain, the Meninges, and the Venous Sinuses.) With an Introduction by ERNST VON BERGMANN. Second and Revised Edition. Johann Alt, Franfort-on-the-Main, 1896. Translation of the German review of Dr. ARTHUR HARTMANN of Berlin.

The fact that a second edition of this monograph was called for within a year is evidence that it has filled the want felt by both aurists and surgeons for a comprehensive treatise on the diseases of the brain which complicate suppurative otitis media. Whoever seeks information in this field, especially if he desires safe knowledge upon the questions which are associated with operative interference, is compelled to consult Körner's treatise; in no other publication can such a clear and complete presentation of the subject be found.

The first edition was reviewed by Knapp in the Jan.-April, 1894, number of these ARCHIVES. During the short period which has elapsed since then, the advance in our knowledge of the otitic diseases of the brain permitted considerable increase in the contents of the volume. The number of operations reported during this time had increased from 20 to 79 in cases of sinus-phlebitis, and from 55 to 92 in cases of abscess of the brain. This made it necessary to rewrite the chapters on these operations. Septic diseases have been separated from pyæmic, and separate chapters have been devoted to meningitis serosa and to meningeal hyperæmia with cerebral œdema—a picture of disease which had received but little consideration.

A review of the individual contents of the work could not possibly take the place of a perusal, and on this account is omitted.

Dr. VICTOR URBANTSCHITSCH: **Ueber Hörübungen bei Taubstummten und bei Ertaubung im späteren Lebensalter.** (Acoustic Exercises in Deaf-Mutism and in the Deafness of the Aged.) Urban and Schwarzenberg, 1895. Translation of the German review of Dr. ARTHUR HARTMANN of Berlin.

After having presented his experiences with acoustic exercises at various places, Urbantschitsch describes them in detail in the work before us. The cases of deafness and of deaf-mutism submitted by the author and the director of the Vienna-Döbling Institute for Deaf-Mutes at the meeting of Naturalists in Vienna, and seen by the reviewer as well as a large number of co-specialists, did not seem to justify the conclusion that acoustic exercises had really been productive of any remarkable results. The presentation of the theoretical views of the author in connection with his practical experiences will therefore be received with gratitude, since they include a comprehensive view of all questions bearing on this subject.

As the author remarks in the preface, the methodical acoustic exercises require indefatigable energy and patience; this is, however, rewarded when we observe their favorable influences upon the disposition, the mental state, and the social life of the deaf.

The author's treatment is based upon the fact that in disease of the sound-conducting apparatus or of the sound-connecting apparatus, lack of sufficient excitation of the acoustic receptive power is gradually succeeded by an actual diminution in this power; if the latter is excited methodically by "acoustic gymnastics," hearing can be improved even though the pathological conditions remain unchanged.

The chapter on the influence of methodical acoustic exercises upon the audition of deaf-mutes constitutes the main part of the book. It is prefaced by an historical review which shows that similar exercises have been tried now and then in institutes for deaf-mutes, but have not yet come into any very general use.

To review the method used by Urbantschitsch, even in part, would require too much space. Every aurist will be in duty bound to form his own opinion after a trial of the method; for this purpose it will be necessary, however, for him to study the book. Besides vowels and words, the use of harmonics is an important feature of these acoustic exercises. The author records extensive observations on the forms of deafness, variations in relations to different tones, partial tone-deafness, absence of

musical sense, variations in the acuteness of hearing, acoustic exhaustion, psychic deafness, etc., as these exist in deaf-mutes.

According to Urbantschitsch, experience is necessary to decide whether audition can be influenced by the exercises; hence the latter are experimentally indicated in every case of congenital or acquired deaf-mutism. Among the cases of acquired deaf-mutism, Urbantschitsch was most successful in deafness after cerebro-spinal meningitis, scarlatina, typhoid, deafness due to traumatism, and in two cases of deafness following fright. In some of the cases in which there were favorable results from treatment, the deafness had existed twenty or thirty years. Even after the perceptive power has improved, so long as the usual external auditory impressions are insufficient to excite auditory sensations, the increased functional activity can only be maintained by a continuation of auditory excitation.

The results following methodical acoustic exercises are illustrated by sixty cases in the Vienna-Döbling Institute for Deaf Mutes, which cases had previously been reported. They are as follows:

	Before the use of acoustic exercises.	At the end of six months.
Traces of hearing in.....	32 pupils.	In 11 pupils.
Hearing for vowels in.....	22 "	" 21 "
Hearing for words in.....	6 "	" 16 "
Hearing for sentences in.....	—	" 12 "
	<hr/> 60	<hr/> 60

In addition to improvement in hearing, another practical benefit is the favorable effect upon the pronunciation of the deaf-mute; both effects contribute in facilitating intercourse between deaf-mutes and hearing persons.

Similar results can be obtained in severe or total deafness occurring in the aged. The audition of such individuals must be excited in the same manner and must be stimulated, in addition, by social intercourse, music, and the theatre.

An enumeration of cases forms an appendix to the book.

In regard to the limits within which we may expect acoustic exercises to be effective, we refer to the next review: Bezold's *Das Hörvermögen der Taubstummen*, (The Power of Hearing in Deafmutes).

DR. FRIEDRICH BEZOLD: **Das Hörvermögen der Taubstummen. Mit besonderer Berücksichtigung der Helmholtz'schen Theorie, des Sitzes der Erkrankung und des Taubstummen-Unterrichts. Für Aerzte und Taubstummenlehrer.** (The Power of Hearing in Deaf-Mutes. With especial reference to Helmholtz's theory, the seat of disease, and the instruction of deaf-mutes. For physicians and teachers of deaf-mutes.) J. F. Bergmann, Wiesbaden, 1896. Translation of the German review of Dr. ARTHUR HARTMANN of Berlin.

Otology has been advanced and enriched in every direction by Dr. Bezold's extraordinary industry and conscientiousness; the monograph under consideration is another illustration of what can be accomplished in the field selected by him. Exact observations upon the power of hearing in deaf-mutes, as conducted with the continuous series of tones arranged by Bezold, have advanced our knowledge of this condition to a considerable degree.

The author made it possible to carry on these observations in such an exact and complete manner by establishing an uninterrupted scale of tones embracing the limits of human audition. In examining the lower portions of the scale which can be perceived by the normal ear, Bezold uses large tuning-forks with adjustable clamps; eight tuning-forks of this character are used, ranging from C', with 32 V. to a". By moving the clamps, every tone of the scale can be obtained and used in testing air-conduction as well as bone-conduction. Above a", the tests are made with two covered organ-pipes with movable pistons. These reach to the lower tone limits of Galton's whistle with which the highest tones are tested.

Regarding the method of examination, we must refer to the original. The observations showed that a large number of deaf-mutes hear a greater or lesser portion of the scale wonderfully well and for a surprisingly long period; that the limits beyond which there is no perception of the scale, are frequently very sharply defined; and that, in regard to the source of tones employed, the intensity exceeded by far the excitation threshold of the ear, within the limits in which it was at all sensitive to sound. The most interesting result of the observations was the very frequent occurrence of partial defects, in which sometimes the upper and sometimes the lower limits of tones were absent; sometimes single or multiple gaps or islands were found which showed no perception at all.

Bezold divides the remains of the power of hearing which he found in groups, as follows :

I. Islands in.....	28	Organs of hearing, or	17.7 %
II. Gaps in.....	28	" " " "	12.7 %
III. Defect of the upper half in	1	" " " "	0.6 %
IV. Defects of upper and lower ends of scale in.....	8	" " " "	5.1 %
V. Defect at lower end of scale above four octaves in....	18	" " " "	11.4 %
VI. Defect of lower end of scale below four octaves in....	33	" " " "	20.9 %
Total.....	108	Organs of hearing, or	68.4 %

It was of especial importance to determine the relation between the remains or rests of hearing in the congenital and in the acquired forms of deaf-mutism. Concerning the latter form, we will notice only those observations which apply to active or to former cases of otitis media purulenta. In every case of this sort, there was a loss of perception of the upper portion of the scale, *i.e.*, for Galton's whistle, and in most cases also of a smaller or greater part of the scale below this pitch, down to three octaves. In two instances, a small portion in the middle of the scale represented by Galton's whistle had been preserved. Bezold considers this a corroboration of Helmholtz's theory, since it can be assumed that in otitis media purulenta there is implication of the labyrinth through the fenestræ, and on this account, the beginning of the lowest turns of the cochlea must be involved.

The speech-physiological investigations of Helmholtz, Oscar Wolf, and others have defined the pitch which belongs to vowels. The ability of deaf-mutes to hear vowels agreed with their power to perceive the corresponding pitch of tones. As a result of his investigations, Bezold came to the following conclusions :

"For the understanding of speech the only absolutely essential part of the scale which must be perceived is the portion included between the tones *b'* and *g''* ; in addition, it is necessary that the tones included within these limits must be perceived when of moderate intensity ; if the duration of hearing for these tones sink below a certain level, it becomes insufficient for the appreciation of speech. In every case in which there is bilateral loss of hearing for this portion of the scale, there will be loss of hearing for speech."

Exact observation of the objective signs, the data connected with the history of the case, and the examination of the hearing furnish valuable points for the diagnosis of the primary disease. The determination of the remains of hearing furnishes the rational basis for all instruction in speech in those cases of deaf-mutism which possess any hearing whatever. Bezold regards it as very improbable that the perception of tones can be improved or even called forth by the conduction of simple tones. The attempts made in the Munich Institute for Deaf-Mutes, often continued for a long time, did not show any certain effects. For acoustic exercises, only speech need be considered, and such exercises must be employed in suitable cases. In schools for deaf-mutes, the instruction must be arranged in three divisions: (1) For those who are absolutely deaf; (2) for those who have become deaf during late childhood and who have preserved some remains of speech; and, (3) for deaf-mutes with partial power of hearing.

In the above lines, we have considered only certain chapters of this instructive book, so as to indicate the nature of its contents. Whoever studies it, will find himself well repaid.

Dr. J. MICHAEL: Die Behandlung der Mittelohr-eiterungen. (The Treatment of Otitis Media Purulenta.) Volkmann's Collection of Clinical Lectures, New Series, No. 133. Translation of the German review of Dr. O. KÖRNER of Rostock.

It is a difficult task for a reviewer to do justice to a work which is founded upon a series of surprising and unproven statements which lead to faulty deductions and yet contain a grain of truth.

About the only value of the work lies in the statement that, in the operative era in which we now find otology, extensive operations are sometimes undertaken in cases in which minor operations might answer, or in which any operation might be unnecessary. This is a truth which no one will deny, especially those who have assisted in the advancement of modern aural surgery. Every aurist has operated upon cases, in which, later on, he realizes that surgical interference had been unnecessary. This is naturally associated with the difficulty or occasional impossibility of recognizing, with certainty, the seat, extent, and dangers of suppuration within the mastoid. It will be easily understood, that every one is influenced by the impressions received from his own cases, and that, having had unfortunate experiences as a result of the post-

ponement of surgical treatment in aural suppurations, he will incline thereafter to active interference. Man errs as long as he strives.

If Michael wished to oppose the "*furor operativus*" of modern aural surgery, which he certainly exaggerates, he ought not to have done so by means of a lot of vague statements, which are in part irresponsible and in part false. The proper method would have been to collect cases in which there had been excessive or unnecessary operating, obtaining such examples from his own experience or from literature, and presenting them accurately and in detail. Such a collection of cases might have been accompanied by his criticism, and he would certainly have received much credit for the work.

Instead of this, he opposes the entire system of operations in aural surgery. Even in the indications for paracentesis in otitis media purulenta acuta he differs from the views generally held at the present time. In such instances he reserves paracentesis for cases in which there is delay of the pus in the breaking through. In the acute otitis of influenza, which universal experience has proven frequently to lead to grave complications, he advises the avoidance of paracentesis and advises to prevent the breaking through of the pus, if possible, "*because in those cases which run their course without perforation, we may expect a better prognosis and a more rapid cure.*" This is naturally true of very mild forms. He evidently has not seen any severe cases and has not taken the trouble to become acquainted with them through literature.

Think of his operations upon the mastoid: "*We have re-entered,*" he says, "*the wild currents of Jasser's time*"—demonstrating either that he is not familiar with the indications and methods of Jasser, or that he is unacquainted with those of modern times. His hypothesis, that changes in temperature affecting the surface of the body cause a condensation or rarefaction of the air contained in the mastoid cells, and that this either fills these spaces or empties them, is original but fallacious. He advises waiting without operative interference "*until there are symptoms which point to severe inflammation of the bone, to involvement of the meninges, the brain, or the sinus, or to the occurrence of pyæmia!*" In contrast to this, how correct is Jasser's warning, that the first sign of such complications should serve as the final warning to operate! This shows that Michael is not acquainted with the unfortunately great mortality after operations which are undertaken too late.

But this is not all. *According to Michael, modern aural surgery is directly responsible for the uncomfortably large number of cases of disease of the sinus and of abscesses of the brain which are "constantly" being published by certain aural clinics!* Of course, he furnishes absolutely no justification for this calumny and simply ignores the reports of such complications by authors who did not operate (Toynbee, von Tröltsch, Wendt). Left to themselves, *i. e.*, without operative interference on the part of a modern otologist, according to Michael, aural suppurations rarely lead to serious complications, and "the chances of the subject of an otorrhœa acquiring a fatal cerebral complication are much fewer than those of the healthy individual being attacked by pneumonia or tuberculosis." Of what possible benefit can such a statement be? It can only confuse those who are ignorant of Pitt's unchallenged statistics, which show that one out of every 158 cases of death is due to aural suppuration. We also find the old statement cherished by aurists who are indisposed to operate or ignorant of such procedures: "The chances of a fatal result from narcosis or other complications following prophylactic operations are decidedly greater than the chance of a fatal complication being added to a simple otorrhœa"—a statement which is just the opposite of what can be proven.

We may content ourselves with these extracts, which could, unfortunately, be continued. It is interesting to learn how it was possible for Michael to acquire such views. He operated upon the mastoid about fifty times. "*In all cases it was possible to remove the diseased area by means of the sharp spoon. I have never found any necessity for chiselling open the mastoid.*" This would indicate that Michael has operated only in cases in which the pus had broken externally. What was the result of those cases in which the pus broke internally? Concerning these, he informs us that they fell into the hands of others for treatment, and that "*after a few weeks or months they were operated upon for serious aural complications with greater or lesser success.*" Naturally, the active aurist is held responsible for the unfavorable course, and not the "conservative" otologist who carefully nursed the pus and the danger, until too late.

The question arises, whether it would not have been better to ignore Michael's work than to review it. Certainly not! It occupied a prominent position as a publication, and, unfortunately, there is still a number of aurists who are unwilling or

ignorant in the subject of operating ; these might hail the work as a welcome justification for their inactivity. Those aurists only have the right to discuss the indications for opening the mastoid who have had the opportunity of performing early and late operations in a large number of cases, and have thus been able to draw conclusions concerning the justification or non-justification for these procedures, and to publish such experiences.

Dr. OSCAR BRIEGER : **Klinische Beiträge zur Ohrenheilkunde. Mittheilungen aus der Abtheilung für Ohrenkranke im Allerheiligen-Hospital zu Breslau.** (Clinical Contributions to Otology. Reports of the Aural Division of All-Saints Hospital in Breslau.) J. F. Bergmann, Wiesbaden, 1896. Translation of the German review of Dr. OTTO KÖRNER of Rostock.

Just as in medical meetings we often get more from the personal expressions of the members than from periodicals and papers, we find in Brieger's unconstrained contributions more instruction than in many a good systematic text-book. The author has the advantage of having to present only that which is of immediate interest to him, and the reading of these contributions takes the place of personal discussion upon many of the disputed questions of the day. The value of the book is enhanced by the open and experienced manner in which the author presents his views, which, in certain instances, differ from those held by others.

We do not consider it appropriate to dilate upon the rich contents of the book. We do not wish to save any one the perusal of the work, but wish to recommend it most highly to all our colleagues. Nor do we want to touch upon the few points in which we do not agree with Brieger, for these would require the same extensive presentation which the author has accorded to them.

Dr. A. JANSEN : **Erfahrungen über Hirnsinusthrombosen nach Mittelohreiterung während des Jahres 1893.** (Experiences in Sinus Thrombosis Following Suppurating Processes of the Middle Ear during 1893.) Sammlung klin. Votr., N. Folge, 1895, No. 130. (Collection of Clinical Lectures, New Series, 1895, No. 130.) Translation of German review of Dr. E. BLOCH of Freiburg.

In this instructive treatise, Jansen reports twelve cases of thrombosis, in nine of which the sinus was operated upon, with five cases of recovery. In most of the cases the transverse sinus was

involved ; in one case there was purulent thrombosis of the superior petrosal sinus and simple thrombosis of the cavernous sinus ; in two cases, the bulb of the jugular vein was the seat of putrefactive degeneration. In some cases of affections of the transverse sinus, the neighboring venous channels were also involved, especially the jugular vein ; in one case, post-mortem examination showed thrombosis of the jugular, the transverse sinus, both inferior petrosal sinuses, both cavernous sinuses, and both ophthalmic veins. There was thrombosis of the jugular in eight out of the twelve cases. Limitation to the bulb of the jugular is apparently more common in cases of acute suppuration of the middle ear ; while in cholesteatoma, purulent inflammation of the transverse sinus seems to be more common.

If, therefore, in operating, the transverse sinus is found to be free, the symptoms must be referred to the bulb of the jugular vein and next to the small petrosal sinuses.

In these diseases, the greatest dangers arise from purulent arachnitis, and from metastases to the lungs. The former is more apt to occur if the thrombus of the transverse sinus spreads backwards to the torcular Herophili or in the direction of cavernous sinus. Pyæmic fever is often absent if the thrombus is limited to the transverse sinus and cut off from the jugular vein. If these conditions are not present, pyæmic fever is constant.

As regards the individual symptoms if the sinus thrombosis is located so as to be separated from the current of the blood, there may be no symptoms or only headache. The symptoms depend upon the relations of the thrombosed area to neighboring parts, and to distant effects. The latter include pyæmic fever, septicæmia accompanied by chills, metastases, and optic neuritis. The former are manifestations of meningitic irritation and symptoms due to extension of the thrombus into the jugular vein, the cavernous sinus, the mastoid emissary veins and torcular Herophili, or dependent upon peri-sinus abscesses (disturbances in the movements of the head).

Since, with the exception of the beginning of acute inflammations, most cases of suppuration in the mastoid and of extradural abscess run their course without fever, the occurrence of pyæmic fever is suspicious of sinus thrombosis, especially if it be accompanied by repeated chills. *Choked disc* is absent more frequently than it is present ; if present, however it is of great diagnostic value. It does not indicate especially a thrombus of the caver-

nous sinus (in the three cases of this sort it was absent), but points rather to a marked filling of the arachnoid space with fluid.

Symptoms like restlessness, vertigo, nausea, unsteadiness, delirium, and contractures do not necessarily point to purulent arachnitis; all these symptoms may be present in a case of simple inflammatory reaction of the pia to a collection of pus situated externally, or in a case of phlebitic or pachymeningitic inflammation. This must always be kept in mind in young persons.

If the thrombus involves the jugular vein, the diagnosis becomes easier (hard cord in the neck, swelling of glands, torticollis, tenderness, and dysphagia); the same may be said if it involves the cavernous sinus (swelling of the lids, followed by exophthalmos and finally orbital cellulitis, more rarely paralyses of the ocular muscles); or when it extends to the emissary vein of the mastoid (swelling, tenderness behind the mastoid process).

All the cases of thrombosis of the transverse sinus mentioned in the paper before us were accompanied by peri-sinus suppurations. Among 35 cases of sinus-thrombosis observed by Jansen during the past three years and a half, 31 were accompanied by such abscesses.

The general symptoms of peri-sinus abscesses are not characteristic: slowing of the pulse, vertigo, nausea, vomiting, constipation, and headache. Local symptoms are only of importance in localizing the affection: swelling of the bone, inflammatory infiltration of the soft parts behind the mastoid process or tenderness in this situation, impaired mobility of the head, torticollis. The diagnosis is rendered most certain, of course, when there is an agreement between the general and the local symptoms. If, in addition, pyæmic symptoms are added, there will no longer be any doubt as to the existence of thrombosis of the transverse sinus. Such abscesses occur more readily when there is sclerosis of the mastoid which interferes with extension towards the surface and facilitates a route towards the posterior cerebral fossa.

The earlier we operate upon a peri-sinus abscess, the more favorable the prognosis and the easier it will be to prevent or to discover a thrombus of the transverse sinus. Jansen does not attach much importance to respiratory or cardiac pulsation of the sinus nor to discoloration of its walls; in cases of doubt he punctures.

Jansen's statistics show plainly the favorable results of operative interference when indicated. Of 29 cases of sinus thrombus

without operation, 2 recovered ; of 16 cases in which the sinus was opened, 8 recovered.

Jansen ligated the jugular in three cases, but without favorable results. He believes that it is not necessary when the thrombus is limited to the transverse sinus. An abscess in this situation is separated from the venous channels toward the heart by a solid thrombus, and this should not be disturbed. He advocates, however, ligation of the jugular, when the bulb of the jugular vein, or the sinus just above this, or the jugular vein farther down is involved. He considers irrigation of the emptied portion of the venous channel unnecessary.

In operating, the bone is bared posteriorly, quite extensively, and the sinus is exposed ; this is done partly with the chisel and partly with Luer's forceps. The exposed portion must include the ascending branch up to the lowest horizontal portion. The adjacent dura is also exposed as far as it is diseased. If the thrombus be incised, this is done throughout the area occupied by the purulently degenerated thrombus and to a like extent ; the outer wall of the sinus is excised. Degenerated masses of thrombi are to be scraped from the walls of the vessel. Syringing is to be avoided. The bandage is renewed daily and the patient is kept in the recumbent posture. If the chills and high temperatures continue and sanious pus escapes from the region of the bulb, the jugular vein is ligated, preferably with ligation of the facial. The jugular is also incised up to the base of the cranium, so that no pus is allowed to remain in the veins and possibly extend into the cranial cavity by means of the inferior petrosal sinus.

To be properly appreciated, the histories of these twelve cases, including the symptoms, details of the operations, and subsequent course, must be studied from the original ; in fact, the entire work merits the most careful study.

Dr. OTTO KÖRNER: Die Ohrenheilkunde des Hippokrates. Vortrag, Gehalten in der Abtheilung für Ohrenheilkunde der 67. Versammlung Deutscher Naturforscher und Aerzte in Lübeck, 1895. (An address delivered by Dr. Otto Körner, of Rostock, at the 67th Meeting of German Naturalists and Physicians, Department of Otology, Lübeck, 1895.) J. F. Bergmann, Wiesbaden, 1895. Translation of the German review of Dr. G. ZIMMERMANN, of Dresden.

In the course of this interesting address, Körner demonstrates

by means of the Littré edition, how thoroughly Hippocrates understood and described the complex of symptoms occurring in aural diseases. The picture of disease accompanying, for instance, adenoid vegetations, otitis, and abscess of the brain, is presented in a masterly manner, even though the anatomical basis and the causal relations are by no means correct. Even to-day, it is worth while keeping in mind one of the lessons taught : never to lose sight of the connection which exists between the diseased ear and the body in general.

REPORT ON THE SECOND MEETING OF THE
AMERICAN LARYNGOLOGICAL, RHINO-
LOGICAL, AND OTOLOGICAL SOCIETY.

THIS society, founded a year ago, held its second annual, the first scientific, meeting in New York, April 17 and 18, 1896.

President, E. B. DENCH ; *Secretary*, R. C. MYLES, of New York.

Many valuable papers were presented, which elicited lively and instructive discussions. Of the rhino-otological papers we mention the following :

The Diagnostic Value of Ophthalmoscopic Examination in Cerebral Disease Depending upon Affection of the Ear. By THOMAS R. POOLEY, New York. The speaker emphasizes that optic neuritis never is present as long as the disease is limited to the ear ; it is rare in acute cases. It is noticed in otitic meningitis, sinus-thrombosis, and brain abscess. Its presence strongly supports the existence of severe intracranial complications of ear disease.

Otitis Media Suppurativa with Unusual Perforation in the Mastoid. By E. E. HOLT, Portland, Me. The perforation was into the digastric fossa. The president related another case of the same kind. The discussion dwelt on the dangers of forcible, and the advantages of judicious, syringing of the ear in purulent inflammation.

Deviation of the Nasal Septum ; Operation. Dr. W. C. PHILLIPS presented a boy on whom he had operated for almost complete occlusion of both nostrils. He had completely broken up the septum with an Adams forceps, and then inserted perforated cork-splints devised by J. B. Berens, which had given him great satisfaction, but were liable to produce ulceration when

used longer than from two to four weeks. The advantage of these splints is dwelt upon by C. W. Richardson of Washington, D. L. Hubbard and H. H. Curtis of New York.

Case of Actinomycosis Bovis. Dr. R. C. MYLES exhibited a patient, and said that in this and other cases he had effected a cure by extirpation of the growth.

Hysterical Affections of the Mastoid. Dr. J. E. SHEPARD, Brooklyn, related three cases. In these cases there are no definite objective symptoms; usually both ears are affected, and they are cured by drugs (bromides, etc.), suggestion, hypnotism, and operative procedures.

Diseases and Treatment of the Nasal Accessory Sinuses. Dr. R. C. MYLES exhibited photographs from transillumination. Antrum disease originated, with almost equal frequency, in affections of the nose as in affections of the teeth. The small trocar and irrigation tubes were invaluable for diagnosis. He explores through an opening between the first and second molars. In severe cases of frontal sinus disease he operates externally. In extreme cases of polypi the ethmoid is brittle, in suppuration almost of flinty hardness. He removes as much of the cells as he can. The sphenoid sinuses, 1"-1½" in depth, are not so difficult to open as is generally supposed. The discussion was chiefly about the uncertainty of transillumination. Dr. Myles said that in spite of its shortcomings it was a valuable aid to diagnosis. He stated that colored people had often no or only small frontal sinuses.

Acute Otitis Media as a Complication of Typhoid Fever. Dr. D. A. HENGST, of Pittsburgh, had, by a collective examination, ascertained that in 1228 cases of typhoid fever 28 had been complicated with otitis media.

A paper by Dr. T. C. CHRISTY, of Pittsburgh, on **Ulceration of the Nasal Septum** elicited a long discussion.

The Mastoid and Intracranial Complications of Middle-Ear Suppuration. Dr. E. B. DENCH describes the opening of the mastoid as it is now generally done, and detailed a case of acute otitic lepto-meningitis in which recovery followed an operation.

MISCELLANEOUS NOTES.

MEYER MEMORIAL.—The results, so far, of the appeal on behalf of the above object have been most encouraging. It is hoped that no efforts will be spared in obtaining further subscriptions.

The AUSTRIAN OTOLOGICAL SOCIETY will hold a special meeting in Vienna on June 28th and 29th.

The ST. PAUL'S EYE AND EAR INFIRMARY, Liverpool, has been in great part destroyed by fire. Happily no lives were lost, but a nurse sustained serious injuries by jumping from a window.

Mr. Councillor EDWARD WHITE has contributed £50 to the Brighton Throat and Ear Hospital.

APPOINTMENTS.

Dr. PASSOW, Assistant to Professor TRAUTMANN's Otological Clinic in the University of Berlin, has been appointed Professor of Otology in the University of Heidelberg, to succeed the late Professor MOOS.

ARTHUR H. CHEATLE, F.R.C.S., has been appointed Surgeon to the Royal Ear Hospital, London.

F. J. DIXON, M.A., M.B., B.C. Cantab., C. J. HEATH, F.R.C.S., and W. J. C. NOURSE, F.R.C.S. Edin., have been appointed Assistant Registrars to the Central London Throat and Ear Hospital.

R. W. HERRICK, B.A. Dublin, M.D., has been re-appointed Honorary Surgeon to the Nottingham Throat, Ear, and Nose Hospital.

ST. GEORGE C. REID, M.R.C.S., has been appointed to take charge of the Bacteriological Department of the Central London Throat and Ear Hospital.

DONALD STEWART, M.D., Glasgow, has been re-appointed Honorary Consulting Surgeon to the Nottingham Throat, Ear, and Nose Hospital.

LOGAN CURRIER, M.D., C.M., has been appointed Physician to the Throat and Ear Dispensary, Edinburgh.

Dr. J. MELVILLE HARDIE, of Chicago, has taken charge of the Department of Otology, Rhinology, and Laryngology in the *Annals of Ophthalmology and Otology*, founded by Dr. JAMES PLEASANT PARKER, who died in St. Louis, Mo., February 6, 1896, in his forty-second year.

Contents of the newest number of the *Zeitsch. f. Ohrenhk.*

Vol. xxviii., No. 3, published April, 1896.

H. KNAPP. Further Observations on the Indications for Mastoid Operations in Acute Purulent Otitis Media and its Complications. (Appeared in our January number of 1896.)

O. RUDOLPH, of Munich. Eighteen Autopsies of the Hearing Organ in Measles.

W. KÜMMEL, of Breslau. Contribution to the Intracranial Complications of Ear Affections.

KONRAD REDOUER, of Dantzig. On Spontaneous Recovery of Cholesteatoma and Cholesteatomatous Affections in the Cavities of the Temporal Bone.

BOOK REVIEWS.

KUHNT. Inflammatory Diseases of the Frontal Sinuses.

A. STEUER. Illustrations of the most Frequent Ear Diseases With a guide to the Examination of the Ear. Forty-three chromolithographs and 15 wood-cuts.

EDITORIAL NOTICE.

We beg contributors to send papers to be reviewed in the *Report on the Progress of Otology* to Dr. GORHAM BACON, 63 West 54th Street, New York ; books and monographs in book-form, to the editors.

CONTENTS OF VOLUME XXV., NUMBER 3.

	PAGE
1. A Case of Acute Otititis Media Followed by an Abscess in the Temporo-Sphenoidal Lobe; Operation; Death from Shock; Autopsy. By Gorham Bacon , M.D. (With two figures on accompanying plate)	249
2. The Operation of Mastoid Antrotomy for the Cure of Obstinate O. M. P. C., with Description and Presentation of the Author's Antrotome. By H. A. Alderton , M.D., of Brooklyn, N. Y. (With three drawings)	255
3. Two Cases of Sarcoma of the the Middle Ear. By William Milligan , M.D. (With two figures)	262
4. A Case of Temporo-Sphenoidal Abscess Secondary to Acute Left-Sided Suppurative Middle-Ear Disease; Operation; Acute Hernia Cerebri; Death. By W. Milligan , M D.	265
5. A New Method of Dealing with the External Meatus in Operations on the Mastoid. By Richard Lake , F.R.C.S. Eng. (With one figure)	268
6. The "Mastoid" Antrum a Part of the Middle Ear. By Arthur H. Cheatele , F.R.C.S. (With three cuts in the text)	271
7. On the Present Status of the Various Tests for Hearing. By Prof. Bezold , of Munich. Abridged translation by Dr. J. A. SPALDING, Portland, Me.	274
8. Report on the Progress of Otology during the First Quarter of the Year 1896. By Dr. Arthur Hartmann , Berlin. Translated by Dr. C. ZIMMERMANN, Milwaukee, Wis.	285
Pathology and Therapeutics.	
9. Austrian Otological Society. Session of February 25, 1896	333
10. Reviews and Notices	336
I.—Atlas der Beleuchtungsbilder des Trommelfells (Otosopic Atlas). By Prof. A. Politzer.	
II.—Traité de Chirurgie Cérébrale. By A. Broca and P. Maubrac.	
11. Miscellaneous Notes	341
12. Obituary	341
13. Contents of the Newest Number of the <i>Zeitsch. f. Ohr.</i> Vol. xxviii., No. 4	342
14. Editorial Notice	342

NOTICE TO CONTRIBUTORS.

The editors and publishers of the ARCHIVES beg to offer some suggestions to authors who propose to favor them with their contributions.

1. As original communications the ARCHIVES can accept only such papers as have never been printed nor are intended to be printed in other journals. If a preliminary communication on the subject of a paper has been published, the author is requested to state this in the letter accompanying his manuscript. It is understood that contributors to these ARCHIVES and editors of other periodicals will make no abstracts of the original papers published in this journal without giving it due credit for the same.

2. Authors will receive gratuitously twenty-five reprints of their articles. If a greater number is desired,—notice of which should be given at the head of the manuscript,—only the additional cost of presswork and paper will be charged to the author.

3. In preparing manuscript for the compositor it is requested that the following rules be adhered to:

a. Write on one side of the paper only.

b. Write without breaks, *i. e.* do not begin a new sentence on a new line. When you want to begin a new line or paragraph at a given word, place before it in your MS. the sign ¶.

c. Draw a line along the margin of such paragraphs as should be printed in smaller type—for instance, all that is clinical history in reports of cases, etc.

d. Words to be printed in *italics*, should be underscored once, in SMALL CAPITALS twice, in LARGE CAPITALS three times.

4. Authors may receive proofs for revision if they will kindly return them without delay. We beg however to remind our contributors that changes in the copy are equivalent to resetting, causing so much additional expense. We therefore request them, to make, if possible, no alterations at all in their MSS., or, at least, to limit these to what is of essential importance.